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WAR AND MEDICAL SERVICE

PAUL V. MCNUTT
Federal Security Administrator
Washington, D. C.

NO medicine will you get from me today, not even in homeopathic doses. There are others here who are licensed to practice in that field.

I am not. Indeed, I suggest that no man has any license to expatiate too learnedly after such a day, and so near the nineteenth hole.

Moreover, I have been scooped. Jim Crabtree will tell you about the Public Health Service in the war. Leonard Rowntree can tell you the selective service story with all its implications. George Baehr knows what to do next when the bombs begin to fall. I have been preceded by the South's own distinguished Fred Rankin who will keep telling you, for another year or so, anything you ought to know.

Also, the February 21 *Journal of the American Medical Association* has provided you, for permanent reference, such detail on the Procurement and Assignment Service that no verbal development seems possible. (I will brave Dr. Fishbein, and say that more of that, in the same tone, at 4:30 this afternoon would put you all sound asleep.)

All these can bring you the parts of the picture of the war as it has revolutionized professional responsibilities. And I would have you pause only briefly to put the pieces together.

What could we talk about today in all our discussions of the war and its impact on the home front?

The health of the men upon whom the armed forces draw? Yes, that emphatically. The record of teeth, eyes, heart, ears, and dis-

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ease infection is a tragic commentary upon America's health. It is tragic because of the great lag between what we can do and what we have done.

The need for physicians, surgeons, and dentists to serve the men in the armed forces? Yes, again. Our first 3,500,000 men will require nearly 25,000 doctors and dentists to keep them in fighting trim.

But that only begins the story of the need for medical service in total war. Demands are made that hardly would have been voiced as questions a quarter of a century ago. Yet upon their adequate answer may hang victory or defeat.

What of booming war industry towns? How about Mobile where a ship-building industry that employed 2400 men in November, 1940, will employ 24,000 by next September? Or Childersburg, or Huntsville where great, new chemical plants will quadruple the population in a few more months? Charlestown, Indiana. Rantoul and Sparta, Illinois. Radford, Virginia. San Diego, California.

One might play train announcer and go right on calling the names of towns that, almost overnight, have grown out of their community pants.

Nearly two decades ago, two sociologists picked a middle-western town, said it was typical, named it Middletown, and started to study it. They counted it, measured it, weighed it, and psycho-analyzed it—and, as learned gentlemen do to impress their colleagues —wrote books about it.

That town was Muncie, Indiana. Another Indiana town has been sometimes cited as the epitome of war dislocation. That is Charlestown. Its headaches fit together like a well written mystery story to reveal the problem of the home front.

Review that Charlestown story for drama: America planned an Army. America extended lease-lend aid to democracies across the seas. Industry boomed. Vast, new production was planned.

Old towns doubled in size. New towns took root. Growing industries multiplied village populations, by 5 and 10, and 50.

We had this picture all over the Nation—Rock Island—Peoria —Decatur. Towns from San Diego County to Maine. Charlestown was only one.

Charlestown was a town of 900. The capital and surplus of its one bank was $31,000. Two grocery stores. Two restaurants. One 16-room hotel, one pool room. Four churches. Two rickety,

filthy, wire-meshed cages in a tumble-down building, was Charlestown's jail.

That was Charlestown 3 years ago. Then, one day, back in Washington, the engineers had a meeting. They presented the grist of weeks of study. Transportation routes. Sources of raw material. All the physical, mathematical, industrial factors worked out to pin-point precision. They were ready to pick the place at which to put the world's biggest smokeless powder plant, and a bag-loading plant to handle the output—$146,000,000 of industry to be set down at a place where an executive's pencil checked a map.

All the physical factors worked out, mind you. But not people.

There was no labor near by. There was no labor for $146,000,000 of construction in Jeffersonville, New Albany, or even Louisville. But within 6 weeks after those engineers met in Washington, 5,000 men were working on that site. In another 6 months, there were 30,000 men, and 600 buildings were going up.

Remember those figures—30,000 where there had been only 900 the year before.

Think of the problems that created.

Transportation! Buses. Trains. Jalopy traffic on rural roads!

Housing! Within commuting distance, even as far as Louisville, there were no facilities really adequate to handle such a boom.

Sanitation! Charlestown had had a new waterworks installed two years before; but that was geared to its 900 people. Think of sewerage. Think of the disposal of waste and refuse. Think of the problem of sanitary regulation for the scores of lunch stands that grew up all over the area. And how about the folks that lived in trailers. The schooling of their children. Food supply services. Drugs, and medical care.

Policing! Racketeers! Fellows who wanted to run honky-tonks, or gambling dens, or brothels. Parasites who wanted to gyp and swindle and live on the honest labor of other men.

Clark County's budget, passed the year before, had not contemplated such matters as that.

That was Charlestown. It is the story of a problem America has only begun to meet.

The drama of Charlestown helped to solve its problem. Like the miracle of Dunkirk, like the attack on Pearl Harbor, Charlestown was one of those sudden events that drive themselves in upon the consciousness of men and women.

We have today, all over the United States, the same problems to be met in a workaday world. Not so dramatic as Charlestown. Towns that did not grow from 900 to 30,000 overnight. Towns that grew only 10, or 20, or 30 per cent. Towns that simply grew from 100,000 to 125,000, or 130,000. Maybe the housewife who did not get "downtown" very much, hardly noticed the difference. The grocer and theatre owner liked the feel of crowded stores and sold-out houses.

But still there are workers who cannot find decent rooms to live in. Even the old recreational spaces have given way to warehouses and storage yards and factories. Because the drama of these areas is not so obvious, nobody acts—except the people who think. And the people who stop and think enough to understand are not always in the majority.

Yet, along with that boom, we have towns like Evansville where ice boxes and washing machines, auto body and electric machinery manufacturers were hit by priorities. We have auto towns like Flint, and Anderson, and Detroit where hundreds of families have been cruelly hit.

Such factories cannot be converted overnight. And community life is likely to falter.

Nor is it only towns where industry is to be converted that feel the pinch. Those towns will come back—yes, boom with 24-hour operation as soon as plant conversion is complete.

But think, too, of rural areas. In Alabama, 31 out of 67 counties are losing population as the mighty effort of the war draws workers to industrial centers.

Sometimes I think the most acute problem is that of the counties which will lose population, faced with readjustment, all along the line. Fewer people paying taxes; remaining business less able to pay. And perhaps, as summer swings around, fewer men to man farm tractors, hoe the fields, and harvest the crops.

Now then, who will provide the medical care?

No doctor could stake his professional future and his investment on the prospects of a munitions works.

Hope and sympathy go to Indiana's Charlestown, or Alabama's Childersburg. But the hopeful doctor's hard-earned nest egg is not invested there. And events cannot be left to take "their own way." America's industrial army cannot gamble with health—and keep the production line rolling.

Or what of the declining area, the rural practice, the small town

—the town without even a munition works?

It seems unnecessary to say that successful, well paid practices, large numbers of physicians are to be found in the cities. It is the rural community, or the very small town which is most often served by one or two relatively low income doctors. It is not then a professional judgment, but simple arithmetic that tells us that one might take a hundred physicians from a community that boasts a thousand doctors, and dilute the remaining service to cover the whole community, but that such a process is impossible in the community which has only one or two physicians.

Thus, while the military forces and certain areas call for doctors, other areas lose them. Yes, lose them below the danger point. That is the problem the Procurement and Assignment Service faces. The problem of relating America's total available physicians to the total needs of the war. Another problem is that of relating specialized training to unusual, specialized demands.

Thanks to the enthusiastic collaboration of America's physicians, that problem is being vigorously approached.

What does the Procurement and Assignment Service mean to the individual physician?

Every one of you is serving voluntarily within your community. That is the obligation of war.

Every doctor will be given the opportunity to participate. That does not mean uniformed service. It means intelligent assignment to the points of greatest need.

But—and let me emphasize this point—there is no intention to dislocate essential medical services.

Need I say that, in common with every soldier and sailor, every industrial worker and civilian servant, every farmer, and every engineer, we are all in the Army now. This is total war. The alternative to service and discipline now is a Nazi straight jacket in years to come.

Mechanized war presents another challenge to physicians. Despite our best efforts at prevention, despite all physicians and engineers can do, we face, as the President has phrased it, "unhappy casualty prospects."

Mechanized brigades may mean fewer deaths, but they are likely to mean more minor casualties, more smashed fingers, useless arms, crippled legs. Production of mechanized equipment, by multiplying the content of the industrial process, will mean more industrial casualties.

As we face that sad prospect, total war has made a fundamental change in our attitude toward the disabled. No longer shall we regard rehabilitation as a humanitarian or "welfare" measure designed to salvage the self-respect or provide incidental income for the disabled individual. He is a *person,* a valuable person. He must be rehabilitated, vocationally trained, not merely for his own good, but because the Nation needs him. And not vocationally trained in some obscure handicraft, the products of which are intended for Fifth Avenue shops or roadside tourist stands. He must be fitted for a place in the main stream of American production. Industry must not disqualify him for his disabilities; it must qualify him for his abilities.

Through all the darkness and tragedy of disability, itself, what a revolution that transition holds for the dignity of the unlucky individual.

At the direction of the President, I have lately appointed a committee to draft a plan for such vocational rehabilitation. On that committee are representatives of the War Production Board, the Social Security Board, the Veterans Administration, Public Health Service, Employees Compensation Commission, the Department of Labor, and the Office of Education. The chairman of the committee is my esteemed assistant, Watson B. Miller. Many of you have known him for many years as the Director of Rehabilitation for the American Legion. He is bringing to this job the insight he has gained in more than twenty years of constructive service in this field.

Daily, in Washington, we are faced with issues which arise along the medical front. How to get priorities to break the bottlenecks for essential hospital equipment and supplies? How to add to the stockpile of opium upon which the morphine of 1944 and 1945 must depend? How to meet the specialized demands of war industry?

And, not at all infrequently, how to stem the threat of venereal disease. Very generally and impersonally I hope that each of you goes home as a committee of one to teach your city fathers the facts of life. Mobilized America cannot wait to stamp out the prostitution racket. This is war.

Many cities, not so long ago, thought that prostitution could be licensed and controlled. For at least three decades that has not been the opinion of either the Surgeon General of the Army, the Surgeon General of the Navy, or the Surgeon General of the Public Health Service.

Pershing, in France, placed the French houses of prostitution

out of bounds. He maintained, throughout the war, and brought home the most disease-free army in history.

So important is venereal disease protection, in the eyes of the Congress and of military and civilian medical authorities, that the policing of local areas can be taken over by the Department of Justice for the repression of prostitution, if local communities do not do their job.

Some local officials did not want to close their red-light districts. They assured us that they had the situation well in hand. Off the record, they said that they believed in segregated districts. The record, however, is going to embarrass those gentlemen.

Preliminary reports which I have seen in some of the communities where these districts have been closed indicate that more than half of the prostitutes taken into custody were infected with syphilis or gonorrhea, or both.

Need I add more to tell you what their closing means in terms of venereal disease control?

I have described a few of our problems. And I have, I hope, indicated our policies toward them.

But beyond the present, beyond these current issues and demands, what is happening?

This is no war for advantage. This is a battle for the world.

Not *who* shall *rule,* but *how.* The free way of life for you and your children and your children's children is the stake of victory.

Old ways are being swept aside. Old institutions shaken to their foundations.

Men die. They die as they die in mines. As they die on the roads. As they die in the mills.

But death shall never stop them.

Of what avail is this sacrifice?

I commend to you, in this hour, an inscription that was chiselled above the door of the Sailors' Hospital in mediaeval Lubeck.

It is necessary to sail the seas.
*It is not necessary to live.**

So for us: It is necessary to be free, to be masters of our own destiny. It is not necessary to live. Nay, not worth while to live if by the leave of tyrants.

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*Reference to this inscription and its translation I owe to Dr. C.-E. A. Winslow, "The Health Front in a People's War," Survey Graphic, March 1942, Page 103.

We fight today not for the easy comfort of yesterday, but for the mastery of tomorrow.

Yesterday, medicine was a debate of economics and welfare. Today, medicine is a *must.*

We shall have deliberation. We shall have professional decision.

But, meanwhile, we shall have action. Action everywhere, whenever and wherever action is necessary.

On the long road to victory, we are learning the place of the healer. Little Johnny's crippled bones, Billy's cough, Mike's teeth. These mean neither bowed heads, nor mere pain. They are not to be measured in welfare budgets. No, not any more.

Health has a new measure. Good teeth. Sound legs. Ruddy skin. The deep, steady whip of diaphragm. These are measured by rolling production lines in peace or in war.

Planes and tanks. Ships and guns. Shoes and shirts and coats.

Enough for victory. Wave upon wave to wipe the forces of tyranny and aggression from the face of the earth.

Enough for abundance. Well clothed. Well fed, well housed. Security and opportunity for every man, woman, and child.

These are the measures of health. America in peace or in war cannot afford—dare not afford—anything but the best your great profession can do for us.

It is too bad we lost time.

It is too bad it took a war to wake us up.

For little Johnny's crippled bones, Billy's cough, Mike's teeth might have been the margin between freedom—and slavery.

COLLATERAL CEREBRAL CIRCULATION BY MUSCLE GRAFT

Technic of Operation with Report of 3 Cases

FREDERICK E. KREDEL, M. D.
Charleston, S. C.

THE principle of improving collateral vascular flow by surgical procedures has been well established. The Kondoleon operation for lymphatic obstruction of the extremities and the Talma-Morrison omentopexy for relief of portal venous obstruction have had a wide application. Sympathetic denervation has been useful in improving collateral circulation to ischemic extremities where vascular spasm was a factor of importance. More recently some success has been achieved in revascularization of the myocardium rendered ischemic by coronary occlusion. Grafts to the heart of the pectoral muscle by Beck, and of the omentum by O'Shaugnessy, have prolonged life and relieved angina in some cases.

The brain is a frequent site of vascular insufficiency in advancing years. Over half of the so-called cerebral vascular accidents are due to thrombosis rather than to hemorrhage or embolism. In the brain thrombotic or arteriosclerotic occlusion, in contrast to hemorrhage, has a relatively low mortality during the first attack and often leaves the patient with paralysis which, while disabling, is not incompatible with a prolonged survival.

Pathologic as well as clinical studies indicate that in some cases of cerebral thrombosis actual degeneration of the cortex may be relatively slight. The considerable amount of spontaneous recovery that sometimes occurs is good evidence that cortical areas can be thrown out of function by a certain grade of ischemia without actual degeneration. Regardless of the relative roles of vasospasm and actual organic occlusion temporary loss of function must depend upon preservation of the vitality of the neurones concerned. If the neurone dies, as it does in a few minutes when its blood supply is completely cut off, the only possible means of restoration of function is by the assumption of its action by surviving neurones located elsewhere. It seems reasonable to assume that considerable areas of cortex, in some cases at least, continue viable, although the blood supply may remain insufficient for neuronal activity. If this meager blood supply to these ischemic areas could be increased, resumption of function might become possible for those neurones still alive and whose conduction pathways are intact.

From the Department of Surgery, Medical College of the State of South Carolina and the Roper Hospital.

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Recent experimental work on the monkey by German and Taffel[1] demonstrated that new collateral vascular channels can be induced to the ischemic cortex by pedicled grafts of the temporal and suboccipital muscles. Histologic and injection studies demonstrated

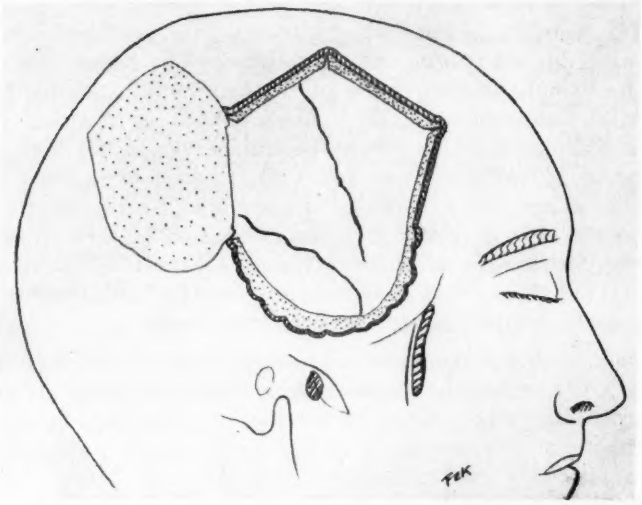

Fig. 1. Exposure secured at operation. Bone flap removed. Subtemporal decompression. Dura opened circumferentially. Fissures of Rolando and Sylvius indicated.

capillary anastomoses between the graft and cortex after ipsilateral carotid ligation. I have adapted this principle of myopexy to the brain for the treatment of localized ischemia in the human brain not only after carotid ligation but also after cortical thrombosis. Certain modifications and precautions are necessary and will be described.

Technic of Operation

A large frontoparietal flap with its base including the auriculotemporal artery, is made and reflected. The temporal muscle is separated from its attachments to the skull. The bone flap is elevated and placed aside in a saline sponge. A generous amount of temporal bone is rongeured away as far inferiorly as possible both for decompression and to provide space for the intracranial position of the muscle without angulation or constriction. The dura is opened circumferentially by making a flap with the pedicle at the posterior angle. The middle meningeal vessels are divided low and secured by suture or silver clip (fig. 1).

The pia arachnoid is gently stripped from the convexity of each gyrus with fine hooks. When stripping is difficult, light coagulation of the pia with the Bovie-Davis unit may be done. The coagulation must not be heavy enough to injure or carbonize the underlying cortex. Patent vessels in the sulci must not be injured.

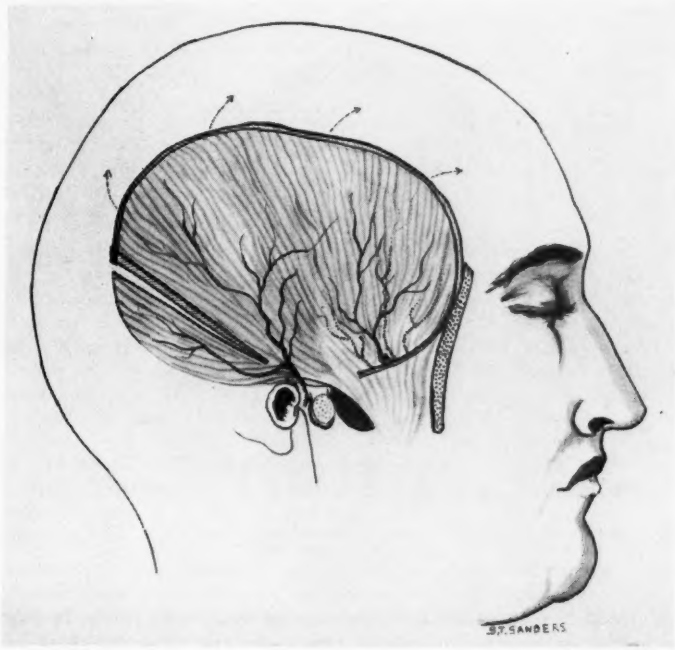

Fig. 2. Temporal muscle in normal position showing incisions for fashioning pedicled graft.

The muscle graft is now fashioned by dividing the muscle from the anterior two thirds of its tendon (fig. 2). This division sections the motor nerve supply to the muscle and also sacrifices an artery which is a branch of the deep temporal. Adequate blood supply to the muscle is preserved in the pedicle by the deep branches of the auriculotemporal artery. While complete division of the tendon might seem more likely to insure against pull on the brain during opening the mouth, it would increase the chance of too great injury to the blood supply and of tearing the pedicle. All periosteum and fascia are stripped from the portion of the graft to be applied to the cortex, but no attempt is made to scarify the muscle. When the graft has been fashioned so that it can be stretched out over the motor cortex well up toward the falx, it is sutured to the under sur-

face of the reflected dura around its entire periphery (fig. 3). As much of the dural defect as possible is now closed over the muscle. The bone flap is replaced and may be held in position by one or two wire sutures. Temporary postoperative compression may result from too rigid fixation of the bone flap. The weak area of the de-

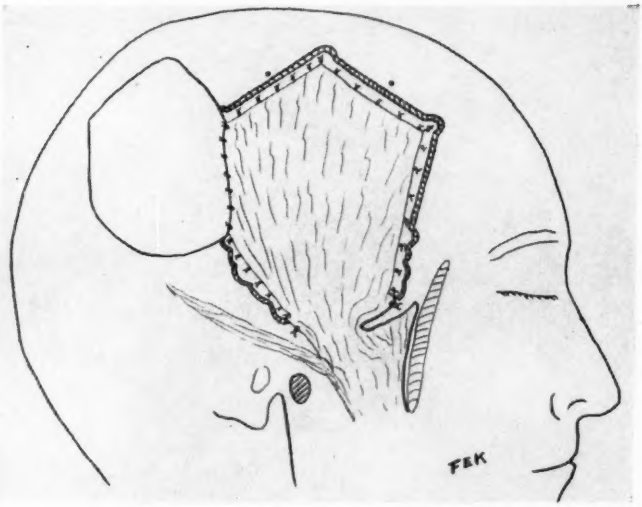

Fig. 3. Suture of muscle graft to dura around entire periphery. Base of pedicle sutured to periosteum.

compression is reinforced by suturing the temporal fascia to periosteum and underneath the galea. The scalp and skin are closed with interrupted fine silk.

The blood pressure should not be allowed to fall during operation, because of possible brain damage[2]. Intravenous saline is started at the beginning of the operation and allowed to run in as slowly as possible. At the first indication of a drop in blood pressure, blood or plasma is added. Basal anesthesia with 80 mg. of avertin per kilogram of body weight has been supplemented by light ether anesthesia in these cases.

CASE 1. *Cerebral thrombosis. Left homonymous hemianopsia. Left hemiparesis with apraxia and hypesthesia. Myopexy to right cortex. Improvement.*

B. S., a white carpenter 49 years of age, was referred by Dr. R. M. Hope on Jan. 14, 1941, for diagnosis and treatment of a left homonymous hemianopsia. Four weeks previously he was struck suddenly with an attack of spots before the eyes and dizziness. He was not unconscious and was able to resume work in a half hour. The attacks continued at frequent intervals for one week. He subsequently noticed inability to see to the left and had a right

temporal headache. There was no history of trauma, or syphilis, nor of personality change. His general health, except for attacks of heat cramps, had been excellent.

Examination showed a complete left homonymous hemianopsia with sparing of the macula. The visual acuity was 20/40 on the right and 20/50 on the left. Both eyes had 20/20 with glasses. The fundi showed only slight sclerosis of the vessels. The blood pressure was 175/110 and there was moderate generalized arteriosclerosis. All other examinations were within normal limits. Roentgenogram of the skull was negative. A diagnosis was made of thrombosis of the right posterior cerebral artery. He was discharged on a regime of rest and iodides.

Six months later, on July 28, he was readmitted with the additional complaint of numbness in the left forearm of one week's duration. There had been subjective increase in the visual loss and some headache. Objective findings were unchanged. He was advised to return for further study when the hot weather abated.

On readmission Oct. 9, 1941, there had been for five weeks increasing difficulty in coordinating movements of the left hand. For three weeks there had been weakness in the left arm and leg. Paresthesias of the left arm and leg had become marked. He could not oppose the thumb to the finger tips nor perform any useful movements on the left. Stereognosis and position sense were lacking in the left arm and leg. Tactile and temperature sense were decreased in the left arm and hand but response to pin prick seemed normal. Muscle power in the left arm was somewhat diminished. The blood pressure varied between 135/75 and 150/100. The fundi showed some arterial spasm as well as sclerosis. Encephalograms were normal except for failure of visualization of the right occipital horn, which suggested the possibility of a hematoma or tumor.

On October 21, under avertin-ether anesthesia, an osteoplastic flap was made in the right occipitoparietal region. The cortex showed moderate white atrophy and marked reduction in vascularity. Several small areas of dense scarring were seen. The arteries were thin, hard and tortuous. Biopsy of a portion of cortex with incision across a thrombosed artery resulted in no bleeding. The rather adherent pia was stripped from many of the gyri anteriorly to the Rolandic fissure with small hooks. The temporal muscle, after separation from the bone flap, was fashioned into a pedicled graft. Enough bone was rongeured away inferiorly to allow the pedicle access to the intracranial cavity. The muscle graft was spread out and sutured around its periphery to the under surface of the reflected dura with interrupted fine silk sutures. The area of cortex covered by muscle was approximately 10 by 7 cm. The dura was closed over the graft except for a transverse slit at the pedicle. The bone flap was replaced and the scalp closed in layers. Sections of the biopsied cortex showed marked thrombosis with scarring. No neurones could be identified.

The postoperative course was satisfactory except for considerable headache for three days. The patient was up in a chair on the seventh day and discharged on the eleventh. As early as the fifth postoperative day he volunteered that his left hand felt in better control. On the tenth day he believed his range of vision had increased. The fields on charting showed a slight advance.

Twenty-four days postoperatively it was apparent that finger movements were improved, although apraxia was still marked and other tests of motor function showed no objective advance. On the thirty-eighth day the thumb

could be opposed to the finger tips quite well with an average time of 5 seconds for the four fingers. A watch, a half dollar, and a fountain pen placed in the left hand were properly identified. Numbers written on the palm could not be named. The patient could tie his shoes for the first time in months. At seven weeks he reported that he was able to do carpentering at home and was anxious to return to full time work. The thumb to finger apposition test required only three seconds. Slight increase in visual fields was recorded.

At three months the finger apposition test averaged two seconds. The patient had been able to lay the flooring of a two-story house. Now at four and a half months postoperatively he has recovered sufficient stereognosis to recognize numbers written on the palm. The electroencephalogram shows some

Fig. 4. Postoperative left lateral view of Case 2 showing position of bone flap and amount of bony decompression. The use of three wire sutures not advisable.

irregular high amplitude slow waves over the right occipitoparietal region which are seen in vascular occlusions; but there were no sharp spikes characteristic of epilepsy.

CASE 2. *Old cerebral thrombosis with hemiplegia and aphasia. Incomplete spontaneous recovery in three years. Myopexy to cortex. Improvement.*

F. W., a white man 50 years of age had been a patient at Roper Hospital many times following a cerebral accident three years ago. His thrombosis came on over the course of a week and resulted in a complete right hemiplegia with aphasia. He was completely unconscious for two days. Some recovery of speech began in about three months and he was able to walk with a cane at the end of a year. Little change had occurred during the past two years. The right hand and arm were useless although slight flexor power was present in the fingers. Simple conversation was possible but speech was slow and halting with perseveration. There was moderate depression and some deterioration but fairly good insight and comprehension. There had been three attacks of grand mal in the past 18 months and numerous minor epileptic attacks. The right lower face and tongue were paralyzed.

At operation on Nov. 29, 1941, the lower half of the motor area was found to be atrophied, depressed, and covered by cystic arachnoid. The general arterial supply seemed moderately reduced. The temporal muscle flap was fashioned and applied to the cortex denuded of its leptomeninges over the convexity of the gyri. The dura was closed over the upper portion and the temporal fascia sutured over the lower margin of the dura. The subtemporal decompression was rather narrow (fig. 4). The bone flap was firmly secured by wiring and the wound closed.

The postoperative course was stormy for eight days. There was severe headache, stuporousness and disorientation. The left pupil became dilated and reacted poorly. There was increase in the paralysis. The temptation to reopen the wound was held in check since it seemed more likely that swelling of the muscle graft rather than hematoma was the cause of the symptoms. At ten days speech began to be clearer and more rapid than preoperatively. At thirteen days improvement in arm movements was evident. By three weeks motion of the face, arm and hand were definitely improved. Because of poor home conditions this patient was kept in the hospital for four weeks postoperatively. On discharge he could walk well without a cane, stand on his right foot, extend his fingers, and raise his hand to the head.

One attack of grand mal occurred as he arrived home; but none has occurred since and phenobarbital has not been taken. At two months he could lift 5 kilograms with the right middle finger compared to 1 kilogram preoperatively. At three months further improvement in the arm and hand permitted scratching the head. Speech was clear and incisive with no perseveration.

CASE 3. *Complete right hemiplegia with aphasia after ligation of internal carotid for intracranial aneurysm. Myopexy. Recovery of speech and facial movements.*

N. L., a white woman of 49 years, was referred by Dr. J. A. Sasser of Conway, S. C., with the history of complete right hemiplegia with aphasia of three months duration, which had followed ligation of the left internal carotid artery, intracranially and in the neck, for aneurysm of the circle of Willis. The surgeon's report to Dr. Sasser stated that "the vessel was so large it compressed the anterior cerebral and posterior communicating arteries." No improvement had occurred in 3 months.

Examination showed an emaciated, depressed, unresponsive woman with complete paralysis with atrophy and contractures on the right. The left pupil showed no reaction to light but constricted consensually with the right. Some vision was preserved in the right eye; none in the left. The tongue deviated to the right. The deep reflexes were increased on the right and the right abdominals were absent. Touch was absent on the right, but some response to pin prick was preserved. The patient cried frequently and could utter only one expression, "uh-uh," which did not vary for possible yes, no, or any other response. Pulsation of the left auriculotemporal artery was preserved.

On Dec. 6, 1941, the Rolandic area was exposed by a T-shaped curved flap with re-elevation of the old frontal flap and making a new one posteriorly. The bone flap was elevated and the opening enlarged by rongeuring away bone posteriorly and inferiorly. The brain showed a very slight amount of arterial circulation. There was an extreme grade of yellow softening. However, some normal pinkish grey color was present in Broca's area and over the anterior tip of the temporal lobe. The pia arachnoid stripped easily with slight bleeding but the underlying cortex was extremely soft and friable. Light coagulation

with the Bovie unit was applied to the leptomeninges where stripping could not readily be done without injury to the cortex. The temporal muscle was fashioned into a flap with a rather narrow pedicle at its posterior tendinous attachment. The edges of the flap were sutured beneath the dura. The pre-Rolandic area up to the sagittal sinus was well covered with muscle. The dura was closed over the muscle superiorly but the lower half of the flap had neither bone nor dura over it. The small bone flap was replaced and part of the large defect was reinforced by suturing the temporal fascia to the galea. The scalp and skin were then closed with interrupted silk. Pathologic report on a biopsied portion of frontal lobe noted advanced degeneration and liquefaction of the cortex with secondary inflammatory infiltration.

The postoperative course after the third day was smooth. The patient rode 100 miles in an ambulance on the fourteenth day. Postoperative x-ray showed the flap in good position. During the second week there occurred a marked improvement in the patient's general reactivity. She became brighter, smiled frequently, and took a renewed interest in life. The voice became brisker and by the tenth day affirmative and negative responses could be distinguished by their inflection. To our astonishment the patient mumbled, "That hurts," when the final dressing was removed. The right side of the face began to move on the twelfth day. Two months postoperatively Dr. Sasser reported that a few monosyllables could be pronounced and that some leg and arm movements were present. Further advance occurred during the third month.

During the past month cerebral myopexy has been performed on two additional cases with old cerebral thrombosis; but the time elapsed is too short to predict the amount of improvement that may occur.

Discussion

This brief experience with myopexy to the brain supplies little clue to the extent of its indications. The severity of degeneration found in Case 3 would suggest that myopexy done immediately rather than weeks or months later is more likely to be helpful in hemiplegia resulting from carotid ligation. In cerebral thrombosis seen during the acute attack an operation of this magnitude would hardly seem justified until enough time had elapsed to predict the improbability of satisfactory spontaneous recovery. On the other hand, the longer one waits after thrombosis the more degeneration of the motor cortex may occur. A considerable series of cases will be necessary to solve this problem. It is generally true that, when little improvement after cerebral thrombosis is evident in several months, the outlook for recovery is poor. In cases showing early improvement decision for myopexy should be deferred, especially if the hemiparesis is not of severe grade.

It is unlikely that myopexy will benefit deep thrombosis causing destruction of conduction pathways. However, as King and Langworthy[3] have pointed out, the usual major lesions, even after carotid ligation, are in the cortex supplied by the middle cerebral arteries. Other structures have a better collateral supply from the contralateral hemisphere through the anterior and posterior cerebral

arteries. Evans and McEachern[4] noted that varying degrees of oxygen deprivation produced variable grades of cellular change from the center to the periphery of a vascular lesion. The major damage seen at operation in four of the five cases reported here was in the Rolandic area.

It is important to determine whether a hemiparesis is due to thrombosis or to hemorrhage before advising a muscle graft. Mead[5] has summarized some points in their differentiation. Few cases of hemorrhage survive the first major insult.

The amount of decompression necessary must be determined by further experience. The actual volume of muscle introduced into the cranial cavity is not great. Studies in fresh cadavers show that not more than 10 c.c. of the muscle is available for intracranial insertion and about one third of this is across the decompression. The average thickness of the muscle graft when spread out is only 2 to 4 mm. The brain in older cases of thrombosis with arteriosclerosis is atrophied; so that more space is available under the dura than is normally present. However, some allowance should be made for postoperative swelling of the muscle graft. Rigid fixation of the bone flap by wiring combined with a limited subtemporal decompression resulted in rather alarming signs of postoperative compression in our second case.

The loss of function of the temporal muscle interferes very slightly with mastication. These patients have been instructed to do heavy chewing on the other side of the mouth with the aim of minimizing possible pull on the brain. Division of the tendon of the temporal muscle at its insertion into the coronoid process of the mandible has been considered as an alternate or supplementary method of defunctioning. The sunken-in appearance of the temporal region is soon obscured by the hair. In one instance transient paralysis of the orbicularis oculi resulted from excessive retraction during division of the temporal muscle from its tendon. The supraorbital branches of the facial nerve are superficial to the temporal fascia and its anterior prolongation and should be spared by careful dissection.

Conclusions

1. Graft of the temporal muscle to the denuded cortex, as proposed by German and Taffel, is a feasible operation in man for the treatment of localized cerebral ischemia.

2. The muscle inserted incranially should be defunctioned to prevent pull on the brain and must be fixed to the dura.

3. The bone flap may be replaced if adequate decompression is done.

4. Serious sequelae have not occurred. No patient has been made worse.

5. Improvement will be inversely proportional to the amount of cortical degeneration that has taken place before the operation.

6. Recovery may begin as early as one week postoperatively.

7. Moderately severe cases of cerebral thrombosis that have failed to improve after several months are most likely to be benefited.

8. Myopexy is suggested as an emergency procedure when complete hemiplegia follows internal carotid ligation.

Summary

An operation is described for the production of collateral cerebral circulation to the ischemic human cortex by a graft of the defunctioned temporal muscle. The early results in three cases are reported.

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HOW CAN THE MEDICAL PROFESSION AUGMENT NATIONAL EFFICIENCY DURING WAR TIME?

LEONARD G. ROWNTREE
Colonel, Medical Reserve Corps, United States Army
Chief, Medical Division,
National Headquarters, Selective Service System
Washington, D. C.

SELECTIVE Service appreciates the privilege of discussing with you the subject you have suggested, "How Can the Medical Profession Augment National Efficiency During War Time."

Since Hitler first issued his challenge to democracy and threatened our national existence and our personal freedom, the problem of how doctors can serve best the interests of National Defense has occupied the minds of all our physicians individually and collectively. Our medical profession is prepared to offer our country its full measure of devotion adequate to meet the needs on all fronts, irrespective of what, where, when, or how. It is hoped that wisdom will prevail in the allocation of medical men, facilities and service, to the war and home fronts.

In the matter of whether or not one should serve on the home or war front, the following story may be apropos:

> After a London raid in one of the slum districts, the neighbors were extri cating an elderly woman from the debris of plaster and falling walls, and as they pulled her out from the hole and dusted the plaster from her gray hair, her neighbor asked if her old man was down there with her. The reply was, "No! The bloody coward went and joined the Army!"

However, before discussing what is to be done, let us first take stock of what American medicine has to offer and what is being done in order that each individual doctor, through seeing the panorama as a whole, may be able to determine better how and where he can fit best into the picture.

There are several great organizations to which a doctor should give consideration for the purpose of offering his services:

ON THE WAR FRONT—The Army, the Navy and their allied organizations.

ON THE HOME FRONT—The American Red Cross; Public Health Service, National and State; Office of Civilian Defense and its numerous connections throughout the educational system whereby national health can be very greatly improved; Selective Service Exam-

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ining Boards — Medical Advisory Boards — Army Induction Boards—as a civilian examiner; the American Medical Association National Defense Committees and their ramifications throughout the various States.

In the beginning, may I say that no nation under the sun has a medical profession with more to offer than have we. Fortunately for this country, the medical profession of America has been adequately organized for medical service on a peace time basis, and the same organization is working smoothly, efficiently, constantly and unselfishly to direct our medical efforts into war time channels. The American Medical Association sent out a questionnaire to all doctors—Did you answer that questionnaire?

As a profession, we have a medical pool of 155,000 practicing physicians, with an incoming stream of only 5300 new doctors annually, from as fine and large a group of medical schools as the world has ever known. Through Selective Service deferment and through commissions offered in the Medical Administrative Corps of the Army of the United States and the Ensign Corps of the Navy, the continued flow of young doctors is expected. Augmentation in the volume of personnel is being attempted through increasing the number enrolled and acceleration in the tempo of training. Fortunately, this country is also reasonably well supplied with fully equipped hospitals, clinics and medical institutions of all kinds and sorts, so the country faces war with a peace time medical profession and with medical equipment second to none.

Fortunately, also, the Medical Corps of the Army and Navy are now, and always have been, splendidly organized and equipped and have maintained a substantial framework in time of peace and are capable of rapid expansion to meet the demands made upon them in time of war. The Army Medical Corps ordinarily comprises 1250 physicians; however, in the World War I, its personnel increased to 30,591 to meet the needs of an Army of 3,673,888. Likewise, the Medical Corps of the Navy ordinarily carries a complement of 875 regular officers, and is so constituted as to be capable of immediate expansion to meet any need. In both branches of these services, adequate provision has been made for peace time needs and war time expansion in all fields, including aviation medicine. *Now* is the time for such expansion; the call has been issued. The first duty of every qualified American doctor in time of war is to offer his services to the military forces. He must express a willingness to serve and then permit the Procurement and Assignment Service to determine where his services are needed most. A continuation of the shortage of physicians in the Medical Corps of the

United States Army would constitute an indictment of American medicine. Where is our Army to obtain doctors for our soldiers if we of the medical profession fail to respond to its call? Have you answered this call by filing your application with Procurement and Assignment—601 Pennsylvania Avenue, Northwest, Washington, D. C.

In addition, the health of our people has been protected by the United States Public Health Service, which constantly functions to prevent disease and to preserve health on the highest plane possible. Preventive medicine is the key note of medical success and must be encouraged and supported in war as in peace. Fortunate we are for the leadership afforded in these three services by our three Surgeons General, James C. Magee, Ross T. McIntire, and Thomas Parran.

In addition, the National Research Council, established in 1916, as the operating agency of the National Academy of Sciences, has functioned continuously since that time. This Council, like the present organization, was created to give advice to the Government "on any subject of science or art." This Council has maintained committees in virtually every specialty, has rendered advice sought on all medical matters, and has supported meritorious research—especially research of national importance. If you are conducting research of national or war time interest, it is wise now to secure the approval of the National Research Council.

Long before war was declared, the American Medical Association created the Medical Preparedness Committee, under the able leadership of Dr. Irving Abell, President of this Congress last year, so that we, as a profession, would be found ready to serve the Nation. This Committee acts nationally, through State societies and locally through county medical societies and touches upon medical needs everywhere. Sub-committees have been appointed to function in each and every specialty. The Advisory Council on National Defense was later transferred to the Federal Security Agency under the administration of Mr. Paul V. McNutt, coordinator for Health and Welfare. Thus, two major organizations and two sets of committees continue to function and guide the activities of the medical profession in the war efforts. Are you doing all in your power to cooperate as doctors in the Program of National Defense?

Under the able direction of Brigadier General Lewis B. Hershey, the Selective Service System functions as a procurement agency for the military establishment. It is not a draft board. It attempts to place each and every man in the position where he can serve best the purpose of National Defense. It has already registered and

examined great numbers of men and has turned over to the Army Induction Board sufficient numbers to produce the present Army. In addition, it has revealed the frequency of defects, deficiencies, disorders and diseases among registrants and thus has held before the eyes of the country a mirror whereby can be visualized the lack of physical fitness relative to Army standards of this country. Some 28,000 doctors have contributed unselfish and uncompensated services to the various Selective Service Boards during the last year and a half. Are you contributing your services to Selective Service through this channel? In the near future, Selective Service will inaugurate a nation wide program for the rehabilitation of rejectees suffering from remediable defects. At the suggestion of the President, moderate compensation has been provided for this program. If you are honored by appointment to the group of designated physicians, it is hoped that you will accept the honor and efficiently discharge your responsibilities to registrants entrusted to your care.

More recently, Civilian Defense has come to the fore, and it is, in turn, making legitimate demands upon the medical profession. Its function is to determine the necessary number of available physicians to care for the medical needs of the civilian population during and subsequent to disasters of any type. The medical profession, individually and collectively, looms very large in this question of civilian defense, and physicians must be willing and able to do their part in this connection in addition to their regular work. Doctors should familiarize themselves by determining how they can serve the community and Nation through the Office of Civilian Defense. This information can be secured through either your county or State Headquarters of the Civilian Defense System. Have you as a physician contacted the Office of Civilian Defense and volunteered for service?

The American Red Cross, true to its history and record, is girding its loins to render increased service on both war and home fronts. It is giving instruction in First Aid, assisting National Defense in organizing medical aid stations and is creating blood plasma banks in various localities. Physicians are urgently needed to assist in all these programs. You should contact your local Red Cross Chapter and see wherein you can help. Have you done this?

Procurement and Assignment

The new agency of Procurement and Assignment of the Office of Defense, Health and Welfare Services under Director Paul V. McNutt, should also receive your careful consideration, irrespective of your individual age. This Agency has been specially created by the President for the purpose of distributing the limited supply of

medical personnel to the best advantage and to see that the civilian population in any one particular section of the country is not left with inadequate medical care, and also for the purpose of seeing that our armed forces have a sufficient supply of medical officers.

This Agency is purely an advisory one and has no authority at the present time to place any person in any one particular spot, but it has its liaison officers in every Corps Area and in every State Capital and Selective Service Headquarters, in addition to its National Headquarters—601 Pennsylvania Avenue, Northwest, Washington, D. C.

There is a full account of this Agency in the *Journal of the American Medical Association* of Feb. 21, 1942. It is suggested that every physician familiarize himself with the working of this Agency and do his part by at once registering with them and filling in any blank they may send him. This is a new Agency and like all new organizations, it is bound to show some rough spots, and perhaps some inequalities, but it will, I am sure, eventually function to the satisfaction of everyone concerned.

Industrial Medicine

Since the United States has become the "Arsenal for Democracy," a new kind of medicine has come into prominence; i. e., Industrial Medicine, which deals with the care of great groups of workers engaged in essential war time occupations. Many new communities have sprung up over night and already established cities have grown. Adequate medical protection is needed for these workers and medical care for their families. Such responsibilities will present new problems and make unusual demands which may tax your strength, time and ingenuity. If and when Industrial Medicine knocks at your door, meet this challenge with an all-out effort.

What Steps Should a Doctor Take to Discharge His Responsibility to the Armed Forces

Gentlemen, we are at war and have been now for three months. Things have not gone too well with us to date. Fortunately, our medical brethren in Hawaii, were prepared. Enough has happened to indicate that our armed forces are made up of real red-blooded American fighters, but half-hearted measures on the part of the Nation will not suffice; only an all-out national effort will bring victory. It is the duty of every doctor to ascertain wherein he can serve best.

Every male physician up to 45 years of age falls under the jurisdiction of Selective Service and is liable for service with the mili-

tary forces. Every such physician up to 45 years of age should fill out the questionnaire provided by Procurement and Assignment Service. If you fail to enroll with this Agency, you will be derelict in your solemn duty and make yourself liable for enlisted service, under provisions of the Selective Training and Service Act.

The greatest need at the moment is for young doctors—men ranging in age from 21 to 36 years. If you are an able-bodied male physician below 36 years of age, there is no problem so far as you are concerned. You are needed now and you are needed urgently. Your plain duty is to indicate, immediately, your willingness to serve, by contacting the Procurement and Assignment Service. The military establishment prefers young medical officers; men who can be rapidly trained and promoted according to merit. The Army Medical Corps is knocking at your door, is calling to you, is appealing to you; if you fail to respond, you will appear to be lacking in patriotism. If under 36 years of age, do not wait for a call—offer your services now.

For men between the ages of 36 and 45 years, the need in the armed forces is not so urgent, but there is no question again of duty. You should be registered with Procurement and Assignment Service, and they will aid you in arriving at the decision as to where you can serve best.

Doctors over 45 years of age are in a different category. The need in the armed forces for such men is still less urgent, but the need in civilian life is great; in fact, imperative in many instances. Strange as it may seem, the doctors advanced in age appear to be most willing to serve. Colonel George Lull stated in his recent address in Chicago, that "only doctors over 60 seem to be really blood-thirsty." Within this age limit, the path of duty is not always so plainly defined. Naturally, if military service is offered you older men, acceptance of the commission would appear almost mandatory, since no call would be made to you older physicians unless the need for your individual services is urgent. Even men of this age would do well to enroll with the Procurement and Assignment Service. Assignment by Procurement and Assignment Service to important civilian service at once clears the atmosphere and indicates that you are following the path of duty.

What Steps Should You as a Doctor Take to Insure Fulfilling Your Responsibility on the Home Front

If, for good and sufficient reasons, you, as a physician, remain outside of the military establishment, then you must take counsel with yourself and your professional brothers as to how you can use

your ability to best advantage. The brother medical man's family and practice must be taken into consideration. In arranging your daily plans, you will have to be ready and willing to work harder and over longer hours because of the increasing over-all shortage of physicians. In addition, you should make yourself familiar with the requirements of the Office of Civilian Defense and be ready to share in emergency. This also applies to Red Cross functions. You should make yourself available to all American Medical Association Committees throughout the state or county; offer your services to Selective Service; familiarize yourself with industrial medicine and with public functions of State and County Medical Societies, and help in the education of the public for war purposes along medical lines by speeches, lectures, etc. If you have retired and are enjoying a well-earned rest, it may be incumbent upon you to again put on the harness and again undertake to pull your weight and do your share of the work; either in the lecture room, in the hospitals, general practice or in any medical line in which you find that you can be of service. All these things are equally true for women doctors. They must also shoulder heavier burdens and try to relieve or replace men who are so urgently needed with the armed forces.

The problem of disposing of your practice must be faced. Perhaps arrangements mutually satisfactory may be worked out with one of your fellow practitioners. Perhaps you may be leaving a community unprotected from the standpoint of medicine. If so, notify your county medical societies and the Procurement and Assignment Service. It may be that they can find ways and means of bearing the immediate needs and of protecting you due to your departure for military service.

Some Suggestions Relative to the Activity of Medical Societies in War Time

The National, State, County, and local Societies should devote increasingly more of their energies and time to such purpose as will help to win the war. All papers, lectures, talks should be scanned critically and only those used that pertain to war problems and to the betterment of the health of the Nation in general. It might be advisable even to reduce the number of medical meetings, thereby saving time and effort of the individual physician and of the profession collectively. Articles for publication should be carefully scrutinized by all editors for the purpose of determining their usefulness, and should be given careful consideration by the authors even before they are brought into being. In other words, the indi-

vidual doctor and the medical profession at large should be streamlined for a maximum war effort.

In order to arrive at a decision as to your duty, the following information is important. The Medical Corps of the United States now, after three months of war, is short of its immediate need by more than 1,500 medical officers and short twelve thousand of the need as envisioned for this year; this according to the recent statement by General C. C. Hillman of the Surgeon General's Office. The responsibility is individual. The Medical Corps of the United States Army will only be as strong as the individual doctors make it.

Once again—what should each and every medical man do to insure rendering optimal war time service? To recapitulate:

1. All male premedical students (bona fide accepted matriculants at approved medical schools within the United States) all first, second, third and fourth year medical students should apply for commissions in the Medical Administrative Corps of the Army of the United States or the Ensign Corps of the Navy, and all first year interns should apply for commissions as First Lieutenants in the Medical Corps of the Army of the United States, or as Lieutenants (J.G.) in the United States Navy, or Naval Reserve.

2. Every male practicing physician already should have registered with the American Medical Association and filled out the questionnaire provided.

3. Every male practicing physician under 45 years of age should register with Procurement and Assignment Service, filling out their questionnaire. This is urgent, immediate and almost imperative for physicians under the age of 36 years, and highly desirable for all men between the ages of 36 and 45 years. It is the part of wisdom for medical men between 45 and 60 years of age to offer their services though chances are that they are needed more on the home front, for the present at least.

4. Every doctor offered a commission in the Medical Corps of the Army or Navy should accept, provided the essentiality for his service elsewhere has not been established.

5. Every older physician, those over 45 years of age, should accept service with the Medical Corps of the Army or Navy, if so requested, since request to the individual indicates a specific need for his particular services.

6. Every practicing physician requested by Procurement and Assignment Service to stay at home and serve in a civilian capacity should acquiesce, since the individual request indicates the existence of a specific and urgent need.

7. Every practicing physician, male or female, who is not commissioned to service with the armed forces should recognize the great increase in his or her civil responsibilities and should act accordingly. He and she should make every effort to contribute their utmost to National Defense, especially with such organizations as Selective Service, Civilian Defense, with the Red Cross, or the field of Industrial Medicine.

8. Every doctor, whether serving on the war or home front, should give a full measure of devotion—all he has to give and, if possible, just a little bit more.

9. Every doctor, irrespective of his field of service, should contribute his all to national morale, refraining from thoughtless criticism; giving cheerfully of himself and his substance to each and every program that enhances national efficiency and brings us closer to Victory.

In closing, let me repeat the last verse of John McCrae's immortal poem, *In Flanders Fields* and the last two verses of the recently written reply (as yet unpublished), by another Canadian officer, Lieutenant Reuben J. O'Neill, in his poem, *Remembrance Day*.

THE CHALLENGE:

Take up our quarrel with the foe!
To you, from failing hands we throw
The torch; Be it yours to hold on high!
If ye break faith with us who die,
We shall not sleep though poppies grow
In Flanders Fields.

THE RESPONSE:

Aye! Sleep ye on,
Ye immortal hosts,
Though trumpet calls
"To arms"—"to posts"—
We'll fight this grand "encore."

God give us strength
To now defeat
To crush the fiends,
And thus complete—
A task undone before.

POLYCYSTIC KIDNEY DISEASE—ITS SURGICAL MANAGEMENT

J. Ullman Reaves, M. D.

Mobile

WHEN we look over the vast literature of the past twenty-five years devoted to polycystic kidney disease one is struck by the disparity in its statistical incidence as diagnosed in hospital admissions and that found in autopsies. This is in part due to the fact that some patients with polycystic kidneys can go about without pronounced clinical signs and in apparent good health for years. Their not being well over a period of time, and not being benefited by the treatment which is prescribed but rather by self-adjustment to their condition, does not suggest to the clinician that a complete urologic survey of the concentrating powers of the kidneys, phenolsulphonphthalein and blood chemistry tests are necessary, or that such procedures might prove beneficial in clarifying an obscure cause of presenting symptoms.

Undoubtedly there are many more cases of this disease than is shown by available statistics. Some are overlooked because of predominating symptoms being other than urologic. Associated complications completely overshadow the clinical picture in others, and undoubtedly some cases never come under our observation because of the mildness of the symptoms produced before the case has advanced, death occurring from some other cause.

Polycystic kidney disease is characterized by the formation of cysts within the parenchyma, the kidney being enlarged and converted into a series of cysts due to congenital occlusion of portions of the renal tubular system. The fact that it is always bilateral is disputed by some. In the reported cases where one polycystic kidney was removed under the assumption that the other kidney was free of the disease, it was found within a few months that typical pyelographic deformity of this remaining kidney had developed indicating polycystic disease. Occasionally, a kidney which is the seat of a group of multilocular cysts due to acquired occlusion of renal tubules and having nothing in common with polycystic disease either clinically or embryologically has been mistaken for unilateral polycystic disease.

That polycystic kidney disease is difficult to classify, is evidenced by the pathologists agreeing that up to a certain period of fetal life development of the kidney in these cases is generally normal, but beyond this period several theories are produced and concurred

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in by outstanding men. However, the most generally accepted theory of imperfect development is that founded in the dualistic theory of renal genesis. It is generally believed that failure of the tubules of the developing kidney to succeed in fusing with the corresponding glomerular unit results in multiple cystic lesions of the kidney which are always bilateral in distribution and are of grave significance to the life of the individual. Many individuals afflicted with this condition survive to middle age and beyond.

Additional evidence of its congenital nature is that polycystic disease is sometimes found existing in several members of the same family in succeeding generations. This hereditary trait has been firmly established, suggesting that the cause of these renal lesions and associated anomalies must be a fundamental defect of the germ plasm, the nature of which is at present unknown and will probably remain so until the lesions are experimentally reproduced.

Grossly the kidney is enlarged, reaching three or four times its normal size and larger, but preserves its general shape. It is studded all over with cysts, so thin walled that the yellowish, clear, red, dark brown or turbid contents shine through, imparting a variegated hue to the organ. On section, the cysts, which vary greatly in size, are found to be scattered throughout the entire kidney. Although occasionally opening into one another it is rare for them to open within the kidney pelvis. The cystic material may be thick, thin, or viscid, yellow, amber or dark brown from hemorrhage, and although usually non-urinous, these cysts may occasionally contain uric acid and other constituents of the urine. As the result of hemorrhage a distended cyst may rupture into the renal pelvis with resulting hematuria, this being one of the symptoms in 30 per cent of the cases. The kidneys in some cases have normal pelves and calyces, and the kidney contour is normal, but the prolonged and general enlargement of the cysts is not uniform thus obliterating the finer structural details. The absence of confirmatory roentgen findings in the presence of a typical clinical picture should not be permitted to negate the clinical diagnosis. Repeated roentgen examinations should be made, for in the course of a year the cysts in congenital polycystic kidneys may grow sufficiently in size to make the urographic findings much more characteristic. In many cases it is so difficult to find any normal-looking kidney tissue that it seems incredible how a person could remain comparatively well with such an advanced bilateral condition.

Microscopically the cysts are lined with epithelium which in the large cysts is flattened, possibly the result of pressure, but cubical and even columnar epithelium is found in the smaller ones. The

intervening kidney tissue usually shows a marked condition of chronic interstitial nephritis with extensive fibrosis, the arteries commonly show intimal thickening, and in advanced cases, with hypertension, the arterioles are involved.

A kidney may be considered polycystic when there are a successive number of small and large cysts throughout the parenchyma and projecting on the surface. These polycystic kidneys produce symptoms in one of two age periods; either in young infants or in adults. In many of the cases we find in the new born, death either occurs at birth or shortly thereafter. A few infants live to develop symptoms or die of intercurrent disease before the age of two or three years. The adult form results from persistence of fetal maldevelopment and related pressure pathology. Most of the adult cases reported are past the third decade. Dr. M. Pinson Neal reported the case of a patient who succumbed to uremia at the age of 84 whose kidneys showed an extreme polycystic kidney development.

Cysts of other organs are a frequent accompaniment of polycystic kidney disease, notably the liver, which is said to be affected in about 30 per cent of the cases, in some of which only a few scattered cysts are found; in other instances the liver is found to be greatly enlarged with its surface studded with projecting cysts and the parenchyma honeycombed by other cysts. These extra-kidney cysts are thought to be due to an embryologic disturbance, and are reported to be found in the ovary, pancreas, spleen, uterus, bladder and epididymis as well.

There is marked variation in the clinical picture presented by patients suffering from polycystic kidney disease. Even high blood nitrogen and hypertension can exist for years in these patients without uremia occurring. The symptoms for the most part are secondary to renal insufficiency or vascular disease for which the patient consults his family doctor or an internist in the hopes of finding relief, but when pain, hematuria, palpable tumor or secondary renal infection sets in the aid of the urologist is not delayed for long. In the early stages no renal impairment is clinically evident, and it is only found by urologic studies of the concentrating powers of the kidney, phenolsulphonphthalein and blood chemistry tests. Often in the new born and occasionally in the adult, the lesion is only found at autopsy. The character and extent of the symptoms naturally depend upon the extent and progress of the disease, augmented by those of coexistent disease symptoms.

The power of the kidney to concentrate and dilute is greatly impaired. Blood chemistry reveals a high retention of nonprotein nitrogen. Patients with polycystic kidney disease often develop a

great tolerance to retained non-protein nitrogen. Some of these cases with a kidney function test of only 5 to 10 per cent of the phenolsulphonphthalein excreted in a two hour period, and with non-protein nitrogen reading as high as 250 mg. per 100 cubic centimeters of blood may go for months without developing uremic symptoms, serving to differentiate these cases from chronic nephritis. Whether the onset of symptoms are acute or chronic, death results most frequently from either uremia or a vascular accident. One of the most frequent and earliest symptom presenting is *pain.* It is usually felt in the region of the kidney on one side, and is dull or colicky in character. Should it be caused by a blood clot blocking the ureter in a case where a cyst has ruptured into the kidney pelvis, the character will be that of renal colic. This could be simulated by external pressure blocking the ureter should the kidney be large and movable, mechanical pressure on surrounding structure may also be a factor. In the case of huge kidneys, tension on the renal pedicle causes pain which is dragging in character and often increased by exertion or relieved by lying down. Intracystic pressure which is suddenly increased as by a hemorrhagic condition can cause acute pain.

This renal pain may be accompanied by chills and fever as well as other evidences of acute renal infection either of one or more cysts, or by ascending pyelonephritis. As inadequate drainage is produced secondary infection can easily set in, and it is surprising that renal infection requiring surgical treatment does not occur more frequently in these cases.

A tumor felt by the patient or the members of his or her family in the kidney region of the abdomen is of grave concern and brings the patient to the physician. If not, a careful examination by the physician finds this mass in most of the cases presenting. This kidney mass is tender on palpation, especially if infection is present within or around the kidney. This enlargement is prone to produce ptosis which may reach such a degree that it will angulate the ureter and thereby establish back pressure with hydronephrosis.

Hematuria is reported as a symptom in one third of the cases and in some cases is the initial symptom. The hemoglobin falls because of this together with the fact that red blood cells are usually excreted by large numbers in the urine. In one of our cases hematuria was so profuse that death ensued while the patient was at his home arranging to return to the hospital.

Albuminuria, which is usually mild in character, is found and though one would expect to find casts, they are present in only one third of the cases.

We would expect to find anemia and hypertension present in these cases in varying degrees. In some cases where the total functioning renal tissue is so grossly reduced as in polycystic kidney disease, it is conceivable that pressure effects on the blood supply may create a situation such as was produced experimentally by Cash with a resultant hypertension. After renal failure hypertension is found to be constant and maybe accompanied by such secondary symptoms as headache, cerebral accident, cardiac enlargement, edema, dyspnea and retinal sclerosis.

The kidney function is always impaired and at a low level, the specific gravity remains low. Vomiting is usually present, and for days the patient may be unable to retain either fluid, semisolids, or solids, thus adding loss of weight and dehydration to a patient whose resistance to disease is already low.

It can readily be seen that unless some intervening malady takes up and battles, uremia makes its appearance and is the most frequent cause of death.

In the early stages, a hardly noticeable elongation and narrowing of the calyces is seen. In the advanced cases, intravenous pyelography is valueless because of the impaired kidney function. Retrograde urography is the greatest diagnostic procedure: with this we demonstrate the low position of the kidneys, which are usually enlarged and irregular, as well as the marked "dragon like" deformity of the kidney pelvis and calyces which is unmistakably diagnostic. The roentgenogram is usually typical, but a differential diagnosis might have to be made from malignant neoplasm, bilateral hydronephrosis, pyonephrosis, kidney calculosis, and chronic cardiovascular kidney disease.

The pressure formed by the slow enlargement of these cysts upon the intervening parenchyma gradually diminishes functional activity. This together with the added weight of such enlargement, causes these patients to learn early that they cannot do the things other people do where physical exertion is involved. They seek treatment for the secondary symptoms of the true condition and go from doctor to doctor until their faith in medicine is pretty much shattered in all medication other than sedation. Since the cause cannot be reached or corrected, our attention must be directed to combating the destructive progress which is inevitable. This is the same as given in any chronic nephropathy, such as rest, avoidance of physical or mental stress, together with dietetic regulations or any other procedure which will lessen the overloading or irritation of the diseased kidney. Unfortunately such medical treatment does not

cure or arrest the destructive progress of this disease. This progress toward and with uremia is much slower in some cases than in others. There can be no question that the indications for non-operative or operative treatment of such complications as calculi, acute and chronic infection of the kidney, as well as perinephric abscess should not differ from the treatment called for in kidneys in cases in which no polycystic disease exists.

Fig. 1. Double pyelogram of case reported prior to operative procedure.

A non-protein nitrogen of 60 mg. per 100 cubic centimeters of blood is considered a contraindication to operation, but there are times when surgical procedures are indicated and are even life saving, especially in the face of death dealing complications, such as (a) severe pain, (b) severe vomiting, (c) severe bleeding, (d) threatening uremia, (e) persistent suppuration, (f) tuberculosis, (g) neoplasms, (h) and hydronephrosis. The multiple puncture of the cysts as outlined by Rovsing should be carried out because of the marked diminution of the size of the kidney which results, as well as relieving the pressure on the remaining parenchyma

thereby hoping to restore enough kidney function to retard the sands of time.

These patients are usually in such physical condition that the least amount of shock by either anesthesia or operative technic is of prime importance. The operative procedure is directed to relieve pressure on the remaining parenchyma by emptying the cysts, or as many of them as possible, and to remove any complicating barrier existing. The approach should be through an extraperitoneal, muscle-cutting, lumbar incision, which should be long enough to give good exposure without disturbing the kidney bed too much. We believe that the puncturing and drainage of as many cysts as possible as advocated by Rovsing should be the primary factor. The operator at the time to use any method of opening these cysts he deems the most practical. This should be gone about with as much rapidity as possible and with thoroughness. It will be noted that varying amounts of intracystic pressure is evidenced as rupture or puncture of the cysts proceed. Sometimes a second operation becomes necessary, and the first operator might be re-employed, therefore extra care should be taken to preserve Geroto's fascia intact if possible, bringing it well together after adequate Penrose drains are placed. The drains should be left in for a considerable period so as to give vent to all secretions and facilitate granulation of the surfaces in the hope of retarding or preventing the reformation of the cysts.

It is little wonder that a large mortality is experienced in these operations. Most operative procedures are undertaken when a dramatic situation arises and the life of the patient is actually threatened. Grave risk is always prevalent with or without any surgical interference. If symptoms are eased and the patient made more comfortable even in a small per cent of the operative cases, does this not justify the procedure, and at the same time chide us a bit for relying too long on supportive treatment and not standardizing earlier surgical intervention?

I wish to report the following family history in which I find several cases of polycystic kidney disease:

Family History

Nothing can be learned of the cause of death of either the paternal grandfather and grandmother or their ages.

The maternal grandfather died at 60; the maternal grandmother died at 76, both from unknown causes.

Father died at 70 after having been an invalid for 25 years with "kidney trouble," possibly polycystic.

Mother died at 50. She is said to have had some kind of fever for the last two years of her life, and to have had a hemorrhage from her mouth just before she died.

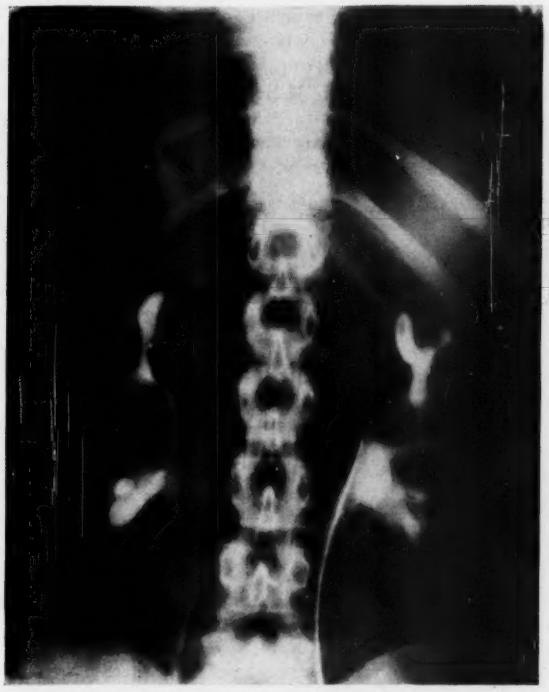

Fig. 2. Double pyelogram of same case after both kidneys had been subjected to Rovsing's operation.

One son died an accidental death at 5.

Another son died unmarried in training at Camp Beauregard during World War 1 of pneumonia.

A third son died at 35. His kidney could be palpated through his abdomen by members of the family. He died in convulsions. His wife, aged 54, is living and well. One of their children (male) died at 13 months with colitis. Two boys living, aged 28 and 32, have not been examined. The younger one is emaciated and complains most of the time about his health.

One married daughter, aged 19, has two children. Her pyelograms are negative (Nov. 8, 1941). Another girl, aged 30, has polycystic kidney disease. She submitted to Rovsing's operation on the right kidney Oct. 29, 1941; on the left kidney, Nov. 25, 1941.

One boy died at 38 with symptoms believed to have been those of polycystic kidney disease. At autopsy the diagnosis was proved. No other organs were involved. This boy married at 21; his wife is living and well. One baby, a boy, was stillborn; one son died at 28, two weeks after we made a diagnosis and pyelograms proving polycystic kidney disease. One girl, married, and

diagnosed elsewhere as having polycystic kidney disease, advised not to become pregnant, and died in convulsions while seven months pregnant, six years after this diagnosis was made. Two other sons, aged 32 and 36 respectively, are living and well, and free of symptoms of polycystic kidney disease, and without pyelographic evidence of any involvement. Two other daughters living and well, one of whom is single, aged 23; the other, married, aged 27, has three children living and well, no other pregnancies.

A fifth son is now 56; his wife is living and well. One child died at 18 months, cause unknown. Three children living and well, ages unobtainable. This son has been in bad health for twenty years, has what his family call "cramping spells," rheumatism, and is reported to have sugar in his urine.

A sixth son, now aged 58, is living and well, as is his wife. One child was stillborn; five others, aged 13, 25, 28 and 32 are reported to be well.

A daughter died at 24 with phlebitis (?) after her baby was a month old; this baby is now 28 and his health is said to be fair. Her first baby died at 18 months with colitis; another child, now aged 32, is living and well. Her husband is living and well at 54.

Another daughter, now aged 62, is said to have gallbladder disease; also sugar in her urine. Her husband is living and well. One child died with colitis at one year, another died with "congestion" at 2, another died with some kind of fever at 7. Six boys are said to be in good health, their ages 23, 28, 31, 35, 38 and 41 years. Two girls, aged 25 and 30, are said to have "pus on the kidneys."

To summarize: In the first generation no history is available. In the second generation the father undoubtedly had polycystic kidney disease. Of his eight children we believe that two of the boys, and one of the girls, were all that were free of polycystic kidney disease; in other words, four of the sons and one of the girls in a family of eight had polycystic kidney disease. Of the grandchildren, two were stillborn, and six others died in infancy. Two boys and four girls in the grandchildren have either been diagnosed or are believed to have symptoms of polycystic kidney disease. Thirteen grandsons and six granddaughters are thought to be free of polycystic kidney disease at this time.

Report of Case

A white woman, aged 29, stated that she had had diseases of childhood without complications; that her appendix had been removed at 13. In 1936 she had been operated on for a "ruptured ovary and tube," following which she had a fecal fistula for three months.

In 1935 she had begun to suffer with headaches and swelling of the stomach, accompanied by intermittent attacks of indigestion. Her headaches have been continuous for the past two years, she has vomited incessantly for periods as long as four and one half months at a time, and now vomits every time she takes anything by mouth. A stricture of the ascending colon following a former colostomy prevents her having a stool unless she takes a saline enema to liquefy it. Three months prior to admission she had hematuria of a month's duration, and at that time an unsuccessful attempt was made at cystoscopy. Blood pressure was systolic 240, diastolic 144.

After the patient had been in the hospital for twenty-four hours she was given a cystoscopic examination at which time double pyelograms were made which showed "dragon-like" deformity of the kidney pelvis with tendency to duplication on either side. The kidneys were very large.

Urine from the right kidney contained numerous pus cells, that from the left kidney contained a few pus cells. The bladder urine was pale, normal odor, alkaline reaction, specific gravity 1.007, negative chemically, two to three pus cells to the field, and a few flat epithelial cells. Phenolsulphonphthalein test showed 4 per cent excreted in the first hour, and 5 per cent in the

Fig. 3. Double pyelograms of a first cousin on case reported. This patient died with acute hematuria two weeks after pyelograms were made.

second hour period. Blood Wassermann was negative, and feces was negative for parasites. Blood chemistry showed 70 mg. of non-protein nitrogen.

Rovsing's operation was explained to her and her family and the operation was advised. On Oct. 29, 1941, the right kidney was exposed, using a total of 80 c.c. of 1 per cent procaine hydrochloride to block the lumbar and four inferior dorsal nerves, as well as to infiltrate the line of incision. All cysts that could be seen or palpated were punctured. These cysts for the most part ranged from .5 cm. to 2 cm. in diameter. Some contained a straw-colored fluid which was under great pressure, others contained a dark bloody fluid, and still others contained an odorless yellow fluid resembling liquid fecal matter. Smears from the cystic contents showed degenerated epithelial cells, detritus and some old blood. The straw-colored fluid which resembled urine contained no urinary elements microscopically or chemically. None of the smears taken showed any bacteria.

A drip of tap water was given continuously through a duodenal tube, and at the end of the first 48 hours after operation her elimination per bowel and kidney was satisfactory, and the urine ranged in specific gravity from 1.003 to 1.010. The duodenal tube was removed at the end of the fourth postoperative day, and she took soft diet with some relish; she stated that it was the first time her head had not been aching for seven years. The blood pressure dropped to 120/80 immediately after operation, and stabilized at 138/84. Her progress was uneventful, and her only complaint was of a pain in the lower right iliac region.

BLOOD CHEMISTRY: Nov. 18, 1941:
Non-protein nitrogen 55 mg.
Urea nitrogen 33 mg.
Creatinine 1.26 mg.
Nov. 23, 1941:
Non-protein nitrogen 55 mg.
Urea nitrogen 33 mg.
Creatinine 1.25 mg.

On November 25 the left kidney was exposed and the same procedure gone through. The same anesthesia was used. After operation on the left kidney the pain in the right iliac fossa disappeared. The cysts found in the left kidney were much the same as those found in the right kidney except for one large cyst in the lower pole.

She had a rather stormy first three days postoperatively, but rallied and made continuous progress. On December 23 the patient was cystoscoped, and double pyelograms made. The urine from the right kidney contained an occasional pus cell, and that from the left kidney contained 5 to 7 pus cells to the field. The pyelograms showed diminution in the kidney pelvis size as compared to the pyelograms which were made prior to operation. On December 29 the patient left for her home in Mississippi.

This patient was so gravely ill that the referring doctor (her uncle) told the family the morning of the operation on the right kidney that she was "in a manner dead." Her gain in physical comfort and general well-being as a result of the operation surely justifies our attempt to relieve the destructive process of the intercystic and intracystic pressure. I believe that this patient would have experienced more years of comfort and well-being had the diagnosis and operative procedure been made earlier in her life.

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THE RELATIONSHIP OF THE U. S. PUBLIC HEALTH SERVICE TO NATIONAL DEFENSE

JAMES A. CRABTREE
Surgeon, U. S. Public Health Service
Executive Secretary, Health and Medical Committee
Office of Defense Health and Welfare Services
Washington, D. C.

YOU have asked me to speak today on the relationship of the United States Public Health Service to the war effort.

May I begin with two preliminary statements: First, the Public Health Service and the State health authorities work together in a partnership to protect and promote the public health; second, the Public Health Service is enjoined, oftentimes by law, at other times by administrative policy, to cooperate with other federal agencies having related health or medical interests.

We in the Public Health Service, like you as physicians, are grateful for our particular skills which we use in an attempt to save lives, relieve suffering and promote our national economy. We are equally proud of the demands that our country is making upon us to help in this time of its greatest peril.

Now that we are in war, the burden of health defense has fallen mainly upon those Federal-State cooperative programs dealing with general public health services, industrial hygiene, nutrition, venereal disease control, and research. In all of these broad segments of activity, the Public Health Service has major interests and obligations.

Our biggest job has been, and still is, to get good sound local health services organized and functioning within the several hundred critical defense areas that are so strategic to our entire war economy.

For the past eighteen months the Public Health Service has undertaken sanitary reconnaissance work in military maneuver regions and areas of mobilization and industrial expansion. We now have first hand information on the public health, housing, hospital and medical service facilities of some 300 such areas. The basic facilities for medical care and public health services were lacking in many of the most strategic regions. The majority of communities in defense areas all over the United States have had to expand their systems for the distribution of water and the disposal of sewage to meet the needs of incoming populations. They have had to strengthen their measures for the sanitary control of milk and

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other foods. They have had to meet shortages in housing and in facilities for recreation. They have had thrown upon them problems of venereal disease control altogether unprecedented in scope. They have had extraordinary burdens placed upon their hospitals and clinics if any, in fact, did exist. They have had too few nurses, both public and private.

Our sanitary reconnaissance has been a valuable means of determining where the problems are greatest and consequently where help should be sent first. Teams of physicians and engineers have been in the field since November, 1940, investigating the needs of these areas. To date, 315 separate defense areas have been surveyed. Fifty-eight additional communities remain to be studied, but this number is subject to change as new areas of military or industrial mobilization are emerging almost daily.

Emergency health and sanitation legislation was enacted on the basis of the needs outlined in these surveys. With funds available through this legislation, the Public Health Service has been supplying workers to these areas as rapidly as they could be recruited and trained. Note that I say "and trained." Prior to the emergency, there were not enough trained personnel to staff adequately our then existing health departments. We have recruited, given a minimum of six weeks of special training to, and assigned over 500 people to some 200 major defense areas of the United States and territories.

In addition, an experienced medical officer has been assigned by the Public Health Service to each of the nine Corps Area Headquarters of the War Department, to expedite military-civilian relationships in all health and medical matters of mutual interest.

Our second major problem arises out of the necessity for protecting the health of industrial workers. Today, America's industrial commitments are the largest in all human history. This year we propose to manufacture 60,000 planes, next year 125,000; this year 45,000 tanks, next year 75,000; this year 20,000 antiaircraft guns, next year 35,000; this year 8 million tons of merchant shipping, next year 10 million. It is estimated that 8 million workers will be transferred from civilian to war production within the year.

Gaps in the production lines are being filled increasingly by women, young adults and older men whose lack of experienced work habits and physical endurance necessitate safety and health maintenance programs of the highest order. Already we are experiencing an increase in industrial accidents. Some of these increases are inevitable with round the clock schedules, employment of inexperienced and partially handicapped workers, and partial depletions of technical staffs.

American industry last year lost 400 million man days of work through all types of disability. Only 10 per cent of this lost time, however, was due to occupational disability, the remaining 90 per cent being due to non-occupational causes. Generally speaking, our large industries have well organized and reasonably effective programs of health supervision; occupational diseases, by and large, are fairly well under control. Our major problem today is in devising workable plans whereby the small industries, which in the aggregate employ more than two thirds of our industrial workers, can provide health and other protective services so essential to maximum production.

The Public Health Service and the 42 industrial hygiene units of States, counties and cities, are applying as extensively as possible all that we know of occupational hazards and how to eliminate them or lessen their effects upon the workers. During the past 18 months, services of this character were rendered in some 7500 establishments engaged in war production.

Cooperating with the U. S. Army, the Public Health Service has completed surveying 30 large arsenals and other military industrial establishments employing 100,000 civilian workers, in addition to regular army personnel. Fifty-five more plants owned by the government, but under private management, are under survey today.

Despite the good beginning which has been made, industrial hygiene services in practically all States and in the great majority of industries are spread extremely thin. It is absolutely essential that we make the wisest use of our actual and potential personnel resources. The contributions, which the nurse can make to industrial health, consideration of which, in my judgment, has been long overdue, now find an important place in the program of the Public Health Service.

Although the statement here may be a platitude, it can bear repeating, namely, that our firing line today is no longer confined to no man's land, but extends to the point where it and our assembly line merge into one; and in order to keep that line strong and rugged the fullest ingenuity must be applied to maintaining an effective partnership between management, engineering, labor, medicine, nursing and public health.

The third major problem, and one which I consider to be among the foremost sectors of the international health front is nutrition. It has been literally catapulted into its present position of eminence by reason of the revolutionary discoveries of research scientists during the past 15 years.

Let no one doubt the fundamental place of food as a munition of war. Let no one assume any longer the complacent position that this nutrition business is merely another one of those "social gains" to be exploited on the coat tails of war emergency.

The millionth ton of American food has already arrived safely in England. This has thwarted the Nazi attempt to starve England into submission; and as long as present shipments are maintained, we have confidence that England will continue to fight and produce. Food for England was a primary objective of the Lend Lease Act.

With increasing demands being made upon America's food production facilities, there can be no doubt of the wisdom of aggressive policies of food conservation and of the application of the most modern principles of human nutrition.

The interests of the Public Health Service in this field traditionally, have been technical. For many years we have been engaged in fundamental studies on the etiology of nutritional disease, clinical criteria of malnutrition, and the relationship between vitamin deficiency and susceptibility to disease. We are continuing this research. However, within the Public Health Service, there is a substantial shifting of interest over to the business of applying the knowledge that has so dramatically emerged during the past few decades. We are emphasizing mass health education for the prevention of nutritional disabilities; we are urging special attention to sound nutrition for workers in defense industries; we are telling people constantly about better foods and the need for a better diet; and we are extending every technical and administrative facility at our disposal toward more effective coordination of the work of the several related agencies of government which in the aggregate reflect, and in large measure determine, our national nutrition policy.

This problem cannot be solved overnight; it's much too complex. As in all major public health problems, the program and strategy must be planned for at least a generation. There is every evidence that our common enemy is exploiting the science of food to the utmost. We can afford to do no less.

A fourth major problem challenging our health defenses is that of the venereal diseases. The interests of the Public Health Service in this problem are dictated not only by considerations of technically sound public health practice, but also by definite legal obligations imposed upon us by the National Congress.

Venereal diseases are and always have been a serious problem during war. The problem is old, extremely complex, and equally difficult. Yet the framework for effective action against the venereal

diseases is already in place, through an official agreement among the War and Navy Departments, the several State and Territorial Health Departments and the Public Health Service on the essential measures to be taken in areas where armed forces or defense workers are newly concentrated. This agreement was further strengthened last year when a national policy regarding prostitution was authoritatively declared through the passage by the Congress of the May Act.

For the first time in the history of military medicine, a blood test for syphilis is now given to candidates for the United States Army under Selective Service procedure. This has resulted in the most extensive case finding program ever undertaken on a national scale. The actual testing of the blood specimens has been carried on as a cooperative enterprise between the Public Health Service and the diagnostic laboratories of the several State and local health departments. Nearly 60,000 of the first million selectees tested were rejected or deferred from military duty because of venereal disease. Obviously, it is not enough merely to discover venereal infections. They must be treated. Up to now, only about half of the men rejected because of syphilis are under treatment in their communities; and although we now have the means for mass control of gonorrhea, local diagnostic and treatment services are far from adequate.

We have made a fair beginning. The Nation's 3,250 venereal disease clinics last year gave more than 11,000,000 treatments to an average monthly load of 411,000 patients; laboratories performed some 18,000,000 serologic tests; epidemiologic and follow up work was carried on by 7800 full and part time workers. But the venereal disease program must be expanded by at least two thirds the present accomplishment if we are to safeguard our soldiers, our sailors, our industrial workers, and our general population. Knowledge of mass measures for the control of venereal disease has a scientific basis that is unimpeachable. The Public Health Service is committed to every reasonable device that will translate that knowledge into effective action.

The importance of the major sector to which I now turn needs no argument before this group. I refer to research, both fundamental and applied. We in the Public Health Service take a pride, which I believe is pardonable, not only in the distinguished contributions which the Service has made in the past to the advancement of knowledge concerning health and disease, but in the fact that we have in the National Institute of Health a research organization unique among related institutions throughout the world.

For the past eighteen months a conscious effort has been made to redirect our research talents and facilities toward problems im-

mediately related to war needs. To keep pace with the introduction of new substances in war industry, we are devoting much of our laboratory and field research to the toxicology of dusts, fumes and gases. Results of previously completed studies of fatigue among truck drivers had already established methods which could be applied in principle to the control of fatigue in war time work, military aviation, and among soldiers and sailors in actual combat. Problems of proper illumination and ventilation take on added importance as industry is required to plan for uninterrupted activity during blackout conditions. A new laboratory has been built to expand our researches in aviation medicine and physiology now conducted in cooperation with the United States Navy. The antityphus vaccine which we developed in 1940 may prove of great importance in controlling or limiting the spread of this notorious stalker of war and famine. The two-dose alum precipitated whooping cough vaccine developed and tested constitutes one of the most immediately practical accomplishments during the year. This preventive agent should prove highly useful in the event war conditions necessitate the shifting of large numbers of children from their normal environments over into new and crowded quarters. This same contingency has given new importance to our continuing research on the so-called children's diseases—mumps, measles and scarlet fever. The shifting of the arenas of war to the tropics has given added impetus to our researches in tropical medicine, such as seeking for chemical substitutes for quinine and studies of refinements and better methods of production of yellow fever vaccine.

We in the Public Health Service take the view that the microbe hunters and hunger fighters, whose work is so dramatically appealing during peace time, have even greater obligations now that every instrument of science within the means of the enemy is being marshalled against us.

Thus far, I have sketched in very brief detail four broad segments of the health front where the United States Public Health Service has major interests and responsibilities. We are engaged in several other fields of activity which merit mention and even emphasis, but only a few of which can be enumerated here in passing because of time limitations.

Through our 27 Marine Hospitals and more than 125 Relief Stations we provide medical care and treatment for the American Merchant Marine. The phenomenal expansion of American Merchant shipping will add 40,000 seamen and 10,000 officers to these beneficiaries by the end of 1943; officers and enlisted men of the U. S. Coast Guard similarly are eligible for medical and hospital care. They number 25,000 today, but this number will likely be

doubled. We must also provide medical supervision and care for all aliens detained under the jurisdiction of the Department of Justice.

The entire Medical Division of the Office of Civilian Defense is manned by medical officers of the Public Health Service who have developed a program of emergency medical care for civilians who may be injured as a result of enemy action. Service engineers have been assigned similarly to develop preventive measures against the ill effects from sabotage or other destruction of sanitary utilities.

The Service was authorized by the Congress at the beginning of the present fiscal year to assist nurse training institutions in meeting the critical shortage of nurses brought about by the war program. Two thousand additional student nurses have been enrolled into training; 3500 graduates are receiving post-graduate or refresher courses.

Under pressure to clear without delay for transportation of war supplies, ships from foreign ports often arrive unannounced and, in many instances, under poor sanitary conditions. Expansion of air traffic to South America and to Africa has greatly increased potential health hazards of yellow fever and other tropical diseases to the United States. These circumstances have imposed serious burdens upon our detention facilities and have necessitated an increase in personnel for ship inspections and other foreign quarantine work.

The presence in malarious areas of large concentrations of troops and of war industries presents a war problem which must be solved by the prompt initiation of control measures on the part of the Public Health Service cooperating with State Departments of Health. During the past year, we effected the drainage and treatment of 300,000 acres of land in the Southern States and in Puerto Rico for the control of the malaria mosquito, thus affording partial protection for 700,000 civilians as well as the nearby military forces.

Bubonic plague, endemic in ground squirrels and other rodents of the West Coast, has spread eastward as far as North Dakota. There is real danger that the infection may be spread to gophers on the midwestern prairies and thence to the domestic rat population of our thickly settled communities of the Mississippi Valley, Great Lakes area and Atlantic Seaboard. As a Nation, we have no immunity against this disease; science has not yet provided a practicable preventive agent; we are devoting our full energies to the establishment of rodent-free zones around strategic sea ports, military camps and industrial centers.

I opened this discussion with two preliminary remarks directed not to my topic, but more or less around it. May I, in closing, take similar liberties.

World events during the past two years have changed many of our concepts of war. War today is not exclusively a struggle between men bearing arms; it is also a contest of industrial production. Its strategy is directed not only to killing soldiers, but to crippling industrial output, to inflicting terror and starvation upon civilian populations, and to smashing civilian morale. For a nation to carry on this kind of war successfully requires not only a unity of purpose which springs from the spirit of its people, but also a strength and endurance which can only be found in a healthy and vigorous citizenship; a strength and endurance not only to bear arms against the enemy, but to support a civilian morale whereby civilian defenses may be kept on the alert, and industrial production continually on the increase.

The extent and complexity of the ramparts of health make it obvious to us, as it must be to you, that this business of marshalling the forces of science for the conservation and wisest use of our vital resources goes far beyond any single agency of government or any one organization or discipline. To fill effectively the wide gaps in our health program calls for the best talent and the clearest thinking that can emanate from such diverse fields as medicine, public health, nursing, engineering, industry, labor, agriculture and economics. The coordination of these talents and the crystallization of this thinking into a unified attack upon the entire health front today constitute, in my opinion, the major challenge to the statemanship of medicine and its related disciplines.

The gaps in our health program must be filled; we must make and keep America strong; our industrial output must increase; our civilian morale must be maintained. We have a tradition of democracy which lifts every American to a new dignity. Our God-given natural resources are without parallel in the history of nations. We have the men, the science, and the genius for organization. We have even been granted a special margin of time. Whether or not we fail is now up to us.

CHEMOTHERAPY AN ADJUNCT TO SURGERY

With a Report of the Use of Sulfathiazole Intraperitoneally

ARNOLD S. JACKSON, M. D.
Jackson Clinic
Madison, Wisconsin

SUFFICIENT time has elapsed and a sufficient number of cases have successfully responded to treatment to state that the advent of chemotherapy has proved one of the greatest contributions to the field of surgery. No single factor has played as important a part in reducing surgical complications and mortality in the period of time it has been used as has chemotherapy. Time has not permitted the compilation of a large series of cases by any one individual or institution, yet the results obtained by many surgeons have been so spectacular as to indicate even more encouraging results in the future. The possibilities for the uses of the sulfonamides have only begun to be explored, but already such dreaded surgical sequelae as peritonitis and pneumonia have been successfully combated; infected wounds have been rapidly cleansed and healed; clean wounds have been kept clean; postoperative cystitis has been eliminated; surgical drainage, always a source of controversy, has been greatly lessened and in many instances has been successfully abandoned; the treatment of pyelitis and other infections of the genitourinary tract has been simplified; many cases of septicemia have been listed among the remarkable cures of chemotherapy; the complications of orthopedic surgery have been greatly curtailed, and there are encouraging reports of its use in osteomyelitis; neurologic surgeons have found it a valuable ally; infections of the mastoid and sinuses have frequently been successfully treated. It appears probable that the sulfonamides will prove more satisfactory than gentian violet or tannic acid in the treatment of burns. Chemotherapy already has played an important role in the World War. British, German and Russian soldiers have carried the sulfa drugs in their kits to apply quickly to their wounds and have consequently, markedly simplified the surgical problems, reduced the periods of disability and lowered the mortality. It is my understanding that our own soldiers will be as well or better prepared. In a report of experiences in the treatment of penetrating wounds of the head as seen in the first American casualties at Pearl Harbor, Ralph Cloward lays special emphasis on the value of sulfanilamide in the wounds.

He advocates the generous use of sulfanilamide not only in the scalp and skull wound but in the missile tract in the brain. His pref-

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erence for sulfanilamide was based on the report of Goodwin and Findley. Their studies showed that sulfanilamide is much more rapidly absorbed into the blood stream from an open wound than any other sulfonamide drug. These experiments were performed on rabbits and the old question comes up as to whether results with animal experimentation are of more value than clinical experience. For the past year I have used sulfathiazole in preference to sulfanilamide in all wounds feeling that the results were more satisfactory and the complications fewer.

Long and Radvin[10] in a report to the Surgeon General of the Army stressed the incalculable value of the sulfonamide treatment of wounds following the Japanese attack at Pearl Harbor. They concluded, "The Committee on Chemotherapy and the Committee on Wound Infection should receive information on the startling efficacy of sulfonamides in the open wounds." In another report appearing last week Moorhead[16] stated that purulent exudate was practically absent from the wounds.

My interest in this subject began in 1938 when one of our interns pricked his finger in performing an autopsy and within 72 hours was desperately ill with a streptococcus septicemia. His life was saved by sulfanilamide which shortly before had come to our attention. Subsequently I was given an opportunity to perform clinical research studies on sulfamethylthiazole and sulfathiazole; the first patient treated was a young man with a staphylococcus septicemia. Since two accounts had appeared of similar cases successfully treated with sulfamethylthiazole this drug was administered, but to no avail. A report of this unsuccessful case was published by Barnstein[1] in March, 1940, and shortly thereafter this drug was withdrawn. In light of subsequent knowledge it was unfortunate that sulfathiazole was not selected.

Intraperitoneal Use of Sulfonamides

The remarkable possibilities of the intraperitoneal use of chemotherapy as an adjunct to surgery was first called to my attention by a communication in the Jan. 25, 1941 issue of the *Journal of the American Medical Association.* In this Mueller,[4] gave a review of 55 cases of perforated appendices with peritonitis successfully treated at the Roosevelt Hospital in New York. A later report[5] of his work appeared in the May, 1941, Jackson Clinic Bulletin. In this same issue was published a communication from Spink[6] of the University of Minnesota Medical School. At the sectional meeting of the American College of Surgeons held shortly before in St. Paul, Spink had cautioned against the use of large doses of sulfanilamide intraperitoneally because of possible harmful effects on the liver. As

a consequence I began the use of sulfathiazole instead, and for the past year have used it in every surgical case in the incisions, intraperitoneally, intravenously or by mouth. This drug was used in all operations to ascertain whether the brilliant therapeutic results obtained early in my experience might be continued in a larger series.

A review of these cases observed over a period of seven months showed that in 161 major operations performed on clean surgical cases in which the powder had been sprinkled in the incision, no infections occurred. This group included appendectomies, herniotomies, cholecystectomies, thyroidectomies, hysterectomies, breast and gastro-intestinal operations.

Most remarkable results have been obtained in the use of sulfathiazole intraperitoneally. There were 13 cases of perforated appendices, 4 with localized abscess, 6 with localized peritonitis and 3 with diffuse peritonitis; 3 cases of pelvic abscesses, 3 abscesses from perforation of a malignant growth of the colon or sigmoid; 2 of perforated ulcer; 2 of perforation of the gallbladder with localized abscess; and one of acute perforation of the gallbladder with free bile throughout the peritoneal cavity.

Although this series is not large, it is interesting to note that there were no deaths or serious complications. No pulmonary sequelae, no instances of prolonged wound drainage, nor of cystitis, postoperative ileus or obstruction occurred. Sulfathiazole has not prevented postoperative thrombophlebitis, two occurring in this study.

To bring this very important subject of the intraperitoneal use of sulfanilamide and sulfathiazole up to the minute I have just compiled a study from a questionnaire sent to twelve leading surgeons of this country and Canada. Surgeons residing in this area with one exception were not queried in order to permit a freer discussion of this paper. The tables indicate that these surgeons favor the use of sulfonamides, but only three reported using sulfathiazole: R. L. Sanders of Memphis, Claude J. Hunt of Kansas City and Gordon S. Fahrni of Winnipeg all report results similar to my own. The other surgeons questioned were Fred W. Rankin, Verne C. Hunt, Raymond McNealy, Vernon C. David, Mont R. Reid, Thomas G. Orr, Fred W. Bailey, Henry W. Cave. Waltman Walters is reserving his opinion pending a study of a control group. Eight of these feel that these drugs have definitely lowered mortality and ten are certain that complications have been decreased. Regarding drainage Verne Hunt states:

> We have closed the abdomen without drainage in many instances where we formerly would have instituted drainage. We have been very favorably impressed with the intraperitoneal use of sulfonamides and have confined our usage of these drugs practically entirely to sulfanilamide . . . we have more

often used 10 Gm. than 5 Gm., and at no time have we seen any untoward results from the use of this amount of the drug.

Fred Bailey rightly cautions against a false security on antiseptic dependence since such ideas encourage careless or incomplete surgery.

Complications

Numerous complications resulting from the use of the sulfa group of drugs have been reported. Thus in a discussion appearing in the *Journal of the American Medical Association* of Jan. 17, 1942, Alton Ochsner stated that his results from the intraperitoneal use of sulfanilamide have not been as dramatic as those of Mueller and Thompson. Some cases of jaundice were seen and bad results from exudate resulted from placing the drug in the abdominal wound. He expressed the opinion that unless there is gross contamination, sulfanilamide should not be used. He warned against the use of sulfathiazole in serous cavities reporting two cases of optic atrophy. He said "We have learned to fear sulfathiazole given intraserously, probably because of the rapid absorption."

In the same discussion Fred Coller opposed the use of these drugs in clean wounds believing that it is unwise to use these chemicals in the hope that they will improve what otherwise might be called inadequate surgery. He agreed with Ochsner that sulfanilamide makes a messy wound and opposed using it. Mueller also opposed the use of these drugs in clean or only slightly contaminated wounds and thought they are seldom indicated intraperitoneally after operation. Cave whose questionnaire was received too late to be included in the table stated that at the Roosevelt Hospital sulfathiazole has been given up because it cakes.

Bick[13] recently reported a study of fifty cases of traumatic and operative wounds, and believed that the use of these drugs hindered rather than aided normal healing.

I feel that not only have all our wounds healed more speedily with sulfathiazole but that the resulting scars, notably in thyroidectomies, have been improved. Sulfonamides applied unevenly and in considerable amount may interfere with wound healing, but by applying sulfathiazole lightly either in the incision or within the peritoneal cavity by means of a salt shaker or blower I have observed no deleterious effect.

Since substituting sulfathiazole for sulfanilamide the complications I have observed have been negligible with the exception of two severe skin reactions, one a case of streptothrix infection of the hand and the other an infected leg wound neither of which occurred on

my service and are consequently not reported here. Two patients showed mild toxic reactions. A slight skin rash was observed on the sixth day in a case of appendiceal abscess. Following the withdrawal of the drug the rash rapidly subsided. Gross hematuria was noted the day following operation, in an 83 year old man who suffered a ruptured appendix with diffuse peritonitis and ileus. The next day a few blood cells were observed on microscopic examination of the urine, and again on the tenth day a few crystals were seen. These sequelae were considered trivial in view of an otherwise uneventful convalescence in a serious case. An effort is made to guard against such sequelae, with careful laboratory studies and close observation of the patients.

Convalescence Shortened

If the results in this small series of cases is any criterion, sulfathiazole may revolutionize the treatment of intraperitoneal infections. Drainage, like battleships, may become passé; certainly drainage will be greatly curtailed, possibly eliminated. The case reports, show that discharge from intraperitoneal abscesses or infections was slight and in some instances, the abdomen was closed without drainage. A few American surgeons, notably Ochsner, have advocated this procedure but the majority have depended upon drainage. Illustrative of the method used in this study was the case of a 68 year old woman who suffered a ruptured appendix with resulting localized peritonitis. Using sulfathiazole intraperitoneally, her abdomen was closed without drainage and she was permitted to be out of bed on the fifth day and to leave the hospital on the ninth day.

Some surgical traditions call for a reconsideration. Among these are the questions of drainage and the keeping of patients in bed following operation. For decades surgeons have drained the abdomen because they had no way to sterilize it. It is possible that chemotherapy and in particular, sulfathiazole will prove the answer to this. In the case previously mentioned, that of an 83 year old man with peritonitis, a solution of 8 Gm. of sulfathiazole in a pint of saline was poured into the belly. The head of the table was lowered so that the solution could wash up around the liver, then the table was rotated from side to side and finally the pelvis was lavaged. Lacking the courage to close this abdomen without drainage, two small soft tubes were inserted, but only a few drops of drainage resulted.

In none of the drained cases have profuse, purulent discharges or wound infections been observed as seen in the prechemotherapy era.

Since drainage can be curtailed or eliminated in abdominal infections, since fine chromic catgut has largely replaced other types of

sutures in abdominal closure and since wound infections are virtually eliminated, our methods of postoperative care will be revolutionized. The time that patients are kept in bed after operation will probably be reduced one-half or more. I have been getting nearly all patients out of bed within a week and some within three or four days. Those who are aged, obese, whose tissues are weak, whose incisions are long, or who need T-tubes, require longer periods of bed rest. Getting patients out of bed early is the best means of preventing a stasis of the circulation and consequent thrombophlebitis and embolism.

Because of the danger of peritonitis, surgery of the large bowel has frequently required two or more stage operations, but chemotherapy in successfully combating peritonitis is permitting more one stage procedures.

This paper deals with sulfathiazole because it appears to give more satisfactory results with fewer complications than sulfanilamide. Other members of our staff have been studying the effect of the other sulfonamide compounds. Sulfathiazole is being used in all my operations. Since it has done no harm, its use will be continued as a prophylactic to combat any infection and for the treatment of any that may be present. All patients who are catheterized receive 15 grains a day for three days as a preventive of cystitis. Postoperatively its use in dressing either clean or infected wounds has supplanted that of all other chemicals.

The following are brief reports of some of the cases of abdominal surgery in which sulfathiazole was used:

Report of Cases

Case 1. A 39 year old female complained of soreness across the lower abdomen and pelvis with chills, fever and malaise. These symptoms had been present for a week. Pelvic examination indicated acute pelvic inflammatory disease. She was given one week's treatment with sulfathiazole by mouth, plus Elliott therapy, with little improvement. Operation revealed huge bilateral pus tubes with an abscess in the region of the right ovary. Bilateral salpingectomy was done, the abscess drained and 10 Gm. sulfathiazole placed in the operative field. Convalescence was uneventful with very slight elevation of temperature and no purulent drainage.

Case 2. A 64 year old female had complained for four days of right lower abdominal pain. Operation was complicated by the factor of obesity but confirmed the diagnosis of perforated appendix with beginning peritonitis. One small drainage tube was used. Eight grams of sulfathiazole were used within the peritoneum as well as in the incision. Convalescence was uneventful; drainage very slight.

Case 3. A 48 year old woman was admitted with a diagnosis of acute intestinal obstruction. Operation revealed perforating adenocarcinoma of the descending colon with abscess. The colon was completely obstructed as was a loop of jejunum adherent to the mass. In freeing loops of bowel the abscess

was opened. A three-stage Mikulicz operation was performed and the abdomen closed without drainage after the insertion of 8 Gm. sulfathiazole. Recovery was rapid, uneventful.

CASE 4. A 68 year old female was admitted with a diagnosis of acute ruptured appendix of about 24 hours' duration. Operation confirmed the diagnosis, revealing localized peritonitis. Eight grams of sulfathiazole were placed in the abdomen following appendectomy, the abdomen closed without drainage. The patient was out of bed on the fifth day and discharged from the hospital on the ninth day. This patient had previously suffered three attacks of cerebral hemorrhage.

CASE 5. An 83 year old male was admitted with a diagnosis of acute surgical abdomen with probable perforated viscus. Operation revealed diffuse peritonitis with pus throughout the abdomen and paralytic ileus, the result of perforated appendix. In view of the findings, as well as in view of his age, the prognosis was considered very bad. Eight grams of sulfathiazole were placed in the abdomen and 2 more in the wound. Two rubber drains were inserted. During the first 24 hours his condition appeared critical, with possible pneumonia complicating the condition. Convalescence was uneventful with but slight fever and discharge.

In these cases as well as in all others in which intraperitoneal infection occurred, surgery was performed under spinal anesthesia; postoperative duodenal suction and intravenous glucose therapy were used.

SUMMARY

A series of 185 major operations is reported in which sulfathiazole was used either in the incision, within the peritoneal cavity or was administered by mouth or intravenously.

In 161 of these cases in which operation was performed in the absence of any infection, sulfathiazole was used as a prophylactic measure and no infection occurred.

In 13 of these cases a perforated appendix with abscess formation, localized or generalized peritonitis occurred. Two of these cases were closed without drainage.

There were three cases of perforated gallbladder and two of perforated ulcer, and three of perforation of the large bowel, the cause of which was carcinoma. There were three cases of acute salpingitis, two of nonspecific origin, all of which were closed without drainage. There were no serious complications or fatalities in the infected group of cases.

The average dose of sulfathiazole used intraperitoneally was 8 gm. It was used in the powder form or with sterile saline solution as a vehicle. One or two grams of powder was used in all incisions.

In this series of 185 cases two complications only were observed, a mild skin rash and a transitory hematuria.

If the studies of Spink, Coller and others are proven correct, sulfathiazole may be safer to use intraperitoneally than sulfanilamide.

By decreasing and eliminating the need for drainage, by preventing and successfully combating wound infection, postoperative cystitis and other sequelae, sulfathiazole has shortened convalescence and permitted patients to be out of bed sooner. In turn this has decreased the incidence of thrombophlebitis and embolism.

A summary of a questionnaire addressed to twelve leading American surgeons indicates their favorable reaction to the use of chemotherapy as an adjunct to surgery.

Chemotherapy will never replace good surgery, but it has already proved to be an adjunct without an equal. Its proper use will considerably reduce the mortality rate even in the presence of mediocre surgery.

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IMPORTANT FACTORS IN THE SURGICAL MANAGEMENT OF PATIENTS WITH SEVERE HYPERTHYROIDISM

GEORGE CRILE, JR., M. D.
Cleveland Clinic
Cleveland, Ohio

INJURIES TO THE RECURRENT NERVE

ALTHOUGH no less emphasis has been placed upon preoperative and postoperative care, I have been impressed in recent years with the effects of certain technical aspects of thyroid surgery upon the postoperative mortality rate. An accident such as a unilateral injury of a recurrent laryngeal nerve, which was formerly considered highly undesirable but not dangerous, I now believe constitutes a definite hazard, for we have observed that the incidence of recurrent laryngeal nerve paralysis seems to be an important factor influencing the postoperative mortality rate of thyroid surgery.

Although paralysis of one or both vocal cords is rarely directly responsible for a postoperative death, it may affect the patient's convalescence in devious ways, and it is in these ways that the mortality rate of thyroid surgery is increased. Injury of a recurrent laryngeal nerve may be the initial accident on which a series of serious postoperative complications may depend.

When a vocal cord is first paralyzed, it is flabby and bowed outward so that it does not meet the cord on the other side. When the vocal cords do not meet, three important protective mechanisms are disturbed. First, the defense mechanism of the glottis is impaired so that fluids taken by mouth tend to be aspirated into the tracheobronchial tree. Second, the cough mechanism which clears the lungs of mucus and foreign material is impaired to such an extent that a true cough cannot be given, and the best the patient can do is to clear his throat. Finally, when a vocal cord is paralyzed, there appears to be an actual increase in the amount of mucus formed in the trachea. In the presence of a fresh vocal cord paralysis, there is an increase in the amount of mucus formed, foreign material is aspirated into the trachea, and there is a striking impairment of the patient's ability to raise the mucus and foreign material by coughing. It is not surprising that these patients show a marked predisposition to the development of atelectasis and bronchopneumonia.

Dr. Crile prepared this paper to be read before the thirteenth Postgraduate Surgical Assembly of The Southeastern Surgical Congress, Atlanta, March 9, 10 and 11, 1942, but he was called to active military duty before the date of the Assembly.

In spite of the fact that pneumonia and atelectasis are susceptible to treatment with the sulfonamide drugs, these complications, even when aborted in their early stages, may have a definite effect upon the convalescence of the patient. An elderly patient with hyperthyroidism who develops pneumonia may have an elevated temperature with dyspnea and cyanosis for only a few hours before the sulfonamides control the infection, but in this brief space the background for other complications may have been set. The strain placed upon the myocardium may have initiated auricular fibrillation. The fibrillation in turn may result in mild cardiac insufficiency. If the serum proteins are low, as is often the case in patients with hypothyroidism, pulmonary or generalized edema may develop.

If the sulfonamides produce nausea and vomiting, both nutrition and fluid balance may be disturbed with attendant disturbances of liver function and of the temperature control mechanism. Briefly, trivial as the initial complication may appear, in the aged, debilitated patient with severe hyperthyroidism, the slightest disturbance of the balance of the patient's normal physiologic processes may cause a crisis of complications capable of progressing to a fatal termination.

Since we have adopted a technic[1] in which the inferior thyroid arteries are ligated outside the capsule of the thyroid, the incidence of persistent accidental vocal cord paralysis has fallen to 0.29 per cent, and in the last 375 cases there have been no deaths.

Stage Operations

Prior to the use of iodine in the preoperative care of the patient with hyperthyroidism, the risk of thyroidectomy was high, thyroid crisis was common, and superior pole ligations or hemithyroidectomies were performed instead of an operation in one stage. At that time, the postoperative thyroid crisis was the most common cause of death.

Between 1925 and 1939 pneumonia was the most common cause of death following operations for hyperthyroidism. In elderly and debilitated individuals and in patients with intrathoracic goiters pulmonary complications presented the greatest problems. The technic of the operation, anesthesia, and postoperative management of the patients were designed to prevent this complication. Even the question of operability and of whether the operation should be performed in one or two stages depended to a large degree upon an evaluation of the patient as a potential candidate for pneumonia.

With the introduction of the sulfonamide drugs, the threat of pneumonia has practically disappeared. The operation need no longer be performed with unreasonable haste in order to avoid

prolongation of anesthesia. The use of a basal anesthesia, induced by the administration of avertin, has been extended to older age groups in which formerly avertin was feared to have a depressing effect that predisposed to pneumonia. The fear of pulmonary complications no longer contraindicates operations upon patients in the middle and late seventies. Moreover, it is rarely necessary to perform the operation in stages.

Today, however, new problems have arisen from the extension of operability to older and more debilitated patients, i.e., the problems of hepatic failure and "metabolic exhaustion." Hepatic failure and metabolic exhaustion are closely allied. Both characteristically appear in older patients, usually those in the late sixties or seventies, and in neither is fever or elevation of the pulse rate an outstanding sign. During the first postoperative day, the only symptoms are an unusual degree of apathy and a certain amount of mental confusion. The confusion may progress into delirium, and the patient may become stuporous and finally comatose. Visible jaundice may be present in some cases, whereas, in others repeated determinations of icteric indices may fail to show any increase above normal levels. If the icteric index is not elevated, there is no way of relating the syndrome to the liver, and hence it is called "metabolic exhaustion." If the presence of jaundice is noted, it is classified as hepatic failure. Although the majority of these patients survive, I have seen two deaths occur from this complication; in both instances only a hemithyroidectomy had been performed.

Formerly, 10 to 15 per cent of all thyroidectomies were performed in divided operations. In the last series of 300 cases, in which there have been no fatalities, only two divided operations have been performed. The changed attitude toward operations performed in stages depends upon two facts: (1) The prolongation of the operating time and the increase in tracheal irritation following a one-stage thyroidectomy, as compared to a hemithyroidectomy, no longer need be feared as favoring the development of a serious pulmonary complication; and (2) in dealing with hepatic failure and postoperative cardiac complications, the patient having a complete thyroidectomy is better able to survive than is the patient with persistent hyperthyroidism following a hemithyroidectomy.

The critical period in the convalescence of the elderly patient with a cardiac complication or with hepatic failure may last for some days or even a week after operation. If the hyperthyroidism is completely controlled, the patient is better fitted to cope with the complication, and the prognosis is improved.

Preoperative Use of Roentgen Therapy

The use of roentgen therapy has been found valuable in replacing superior pole ligation in a small and carefully selected group of elderly patients who are bad risks, whose goiters are small and diffuse, and whose general condition renders operations hazardous. No more than 1,800 roentgen units are given these patients lest wound healing be affected, and to date there has been no increase in the technical difficulties of operation. More intense roentgen therapy causes profound changes in the skin, subcutaneous tissues, and muscle. In two cases in which 3,000 roentgen units were given at another hospital, the healing of the wound was seriously impaired.

After the patient has received a course of roentgen therapy, he is given a high vitamin, high caloric diet, and is discharged to return home for two months, during which time 5 drops of Lugol's solution is given once daily. Upon his return to the hospital, a gain in weight and strength, the disappearance of any mental confusion, and a lowering of the pulse and basal metabolic rates are usually noted. As a rule, thyroidectomy in one stage can then be performed safely. Roentgen therapy has not proved to be of much value in the treatment of hyperthyroidism associated with large nodular goiters.

Postoperative Care

Even though thyroid crisis is now rarely encountered (in a series of 800 thyroidectomies there has been no instance of typical thyroid crisis with uncontrolled hyperthermia and soaring pulse), the postoperative thyroid reaction is still directly or indirectly responsible for the majority of serious postoperative complications. The postoperative thyroid reaction may overburden a damaged myocardium and result in cardiac decompensation; similarly, the postoperative thyroid complication presumably paves the way for hepatic failure and metabolic exhaustion. It is therefore desirable in the bad risk case to minimize this reaction. The patient must receive adequate preoperative preparation and should be treated prophylactically from the time of operation with all the means at our disposal for minimizing the reaction.

A thyroid crisis is difficult to treat, but is relatively easy to prevent. Instead of deferring treatment until the temperature and pulse rate are soaring, the patient should be placed in an oxygen tent immediately after operation, and an adequate fluid intake should be given. The treatment must be individualized; problems arising in connection with a young, strong patient with very active hyperthyroidism may be quite different from those in an elderly and frail patient with a poor myocardium and hyperthyroidism of low

grade. In the young patient an enormous intake of fluid may be required, whereas in the older patient the fluids often should be limited to 2,000 or 3,000 c.c. a day.

In general the important factors from the standpoint of operative risk are the age of the patient and the condition of his heart, rather than the severity of the hyperthyroidism as indicated by the basal metabolic rate. Serious complications are rare in the young adult, no matter how severe the hyperthyroidism may appear to be.

In the aged, however, the situation is quite different. Depressant drugs are well tolerated in the young, but easily lower the threshhold of the aged patient's resistance to pneumonia. Blood transfusion, the oxygen tent, and every resource at our disposal must be utilized to build up the resistance of the aged patient. In the aged, it is better to perform the operation under local anesthesia with a minimum of nitrous oxide analgesia. Similarly, the use of morphine postoperatively should be limited to the minimal requirements.

Although I believe that the administration of small amounts of iodine always should be continued for at least two days after operation, I have never felt that the postoperative use of large doses of iodine exerts any striking effect on the thyroid reaction of a patient who has received full doses of iodine before operation. Iodine does not act upon the tissues of the body nor upon the thyroid hormone circulating in the blood; it acts directly upon the secretory activity of the thyroid gland.[2] For this reason large doses of iodine cannot be expected to produce any further effect upon the postoperative reaction of a fully iodized patient. The best procedure is to give the routine small dose of iodine to prevent the exacerbation of symptoms incident to its withdrawal.

For several years we have made a practice of placing all patients who are bad risks in the oxygen tent immediately after operation. The oxygen tent is used not only for pulmonary complications, but also in the treatment of cardiac failure and uncomplicated thyroid crisis. A fall of temperature from 1 to 3 degrees F. has been repeatedly observed within three hours of the time the patient is placed in the oxygen tent. It is not known whether this effect is the result of the oxygen, of the refrigerated air of the tent, or of a combination of the two factors. That the temperature of the air undoubtedly plays a part in the control of the thyroid crisis is indicated by the fact that fatal thyroid crisis occurs 2.4 times as frequently during the hot summer months as during the rest of the year. The refrigerated oxygen tent therefore is placed over such a patient as soon as the operation is completed. In the presence of cyanosis

higher concentrations of oxygen can be obtained if the oxygen is given by nasal catheter.

A thyroid crisis is a vicious circle of hyperthermia and hypermetabolism. With each degree of elevation of temperature, there is an increase of 7.2 per cent in the basal metabolic rate, and with each increase in the rate of metabolism there is a proportionate increase in the production of heat by the body. One of the chief problems in controlling a thyroid crisis is how to break the vicious circle of hyperthermia and hypermetabolism.

Formerly ice bags were used, and in severe cases the patient was even "packed in ice" to lower the temperature. In the past five years, however, I have encountered no case in which the hyperthermia could not be adequately controlled without the use of ice. This change may be due in part to the better preoperative preparation of the patient, and in part to increased use of the cooled oxygen tent; but the fact remains that the control of hyperthermia is no longer a difficult problem.

The body dissipates its heat in three ways: by conduction, by radiation, and by evaporation. To attempt to promote defervescence by conduction, as by packing the patient in ice, has always seemed to me unphysiologic. The reaction of the body to surface application of cold is a protective one in which the cutaneous vessels contract to diminish the radiation of heat and in which the patient frequently shivers in an automatic attempt to increase the production of heat. These defense reactions automatically attempt to increase production of heat and to decrease its radiation and hence produce an effect exactly opposite to the one desired in a patient who has hyperthermia. An attempt to *increase* evaporation and radiation would be much more physiologic.

Evaporation is dependent upon perspiration, and perspiration is dependent upon an adequate fluid intake. Hence, it is important to give large amounts of fluid to the patient who has severe hyperthyroidism. If the patient cannot take fluids orally, the most effective method of overcoming the deficit is by the continuous, intravenous method. In young, strong patients with severe hyperthyroidism and no cardiac disease, an intake of 5,000 or 6,000 c.c. of fluid per day may be desirable.

Acetylsalicylic acid (aspirin) promotes sweating and is the most efficient antipyretic for the combating of hyperthermia of a thyroid crisis. A drop of from 1 to 3 degrees F. almost invariably follows the administration of 10 grains of aspirin to a patient who has a temperature of 102 to 103 degrees F., and this drop of temperature is usually accompanied by a striking improvement in the

patient's clinical condition. If the patient is unable to take the aspirin tablet orally, it can be crushed and given rectally in a slightly larger dose.

Morphine is the most valuable drug for the control of discomfort and restlessness of patients convalescing from thyroidectomy. The patient's tolerance for morphine was in direct proportion to the degree of elevation of the basal metabolic rate. Patients with high basal metabolic rates, especially when they are in the height of a thyroid crisis, should be given large doses of morphine (up to ½ grain) at frequent intervals. For elderly and debilitated patients the dosages of morphine should be limited so as not to induce depression.

Patients with severe hyperthyroidism have exhausted the reserves of glycogen that are normally present in the liver.[3] The increased metabolism demands fuel for oxidation. After operation it is painful to swallow, nausea and vomiting are frequently present, and the patient takes little nourishment. Thus, at the time when the caloric demand is highest, the patient's liver is depleted of glycogen, and food is not being taken. Unless an adequate caloric intake is promptly restored, the organism literally must oxidize itself in order to provide fuel for the raging metabolism. In patients with severe hyperthyroidism, the continuous administration of glucose solution into a vein will prevent this crisis of catabolic processes and minimize the postoperative elevation of pulse rate and temperature.

It is usually impossible to give intravenously more than 2,000 calories a day in the form of glucose, without losing much of the glucose through the kidneys. This is a small part of the total caloric requirement of a patient in thyroid crisis and should be supplemented with high caloric, high carbohydrate feedings when the patient is able to eat. If the patient refuses food, feedings can be given through a nasal tube.

Each patient with hyperthyroidism presents an individual problem from the standpoint of the psychologic approach, the technic of operations, and the details of postoperative care. No routine can be devised which will satisfactorily take care of all the various contingencies that occur. The elderly patient with auricular fibrillation and hyperthyroidism of low grade presents an entirely different problem from that of the young, strong adult with a high basal metabolic rate. If the best results are to be achieved, supervision for each patient must be individualized with respect to the surgical management before, during, and after thyroidectomy.

Summary

1. Injuries to the recurrent laryngeal nerve may be indirectly responsible for the production of fatalities following thyroidectomy.

2. With the decline in the incidence of vocal cord paralysis to 0.29 per cent, the mortality rate in the last 375 cases in our clinic has fallen to 0.

3. Since the introduction of the sulfonamide drugs in the treatment of postoperative pneumonia, I have found it necessary to perform divided operations in less than 1 per cent of all cases.

4. X-ray therapy has supplanted superior pole ligation in the preparation of patients with hyperthyroidism for thyroidectomy.

5. The importance of diet, sedation, oxygen, and antipyretics in the postoperative care of the patient with hyperthyroidism is emphasized.

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L. MINOR BLACKFORD, M.D., *Editor*
B. T. BEASLEY, M.D., *Managing Editor*
WALTER G. STUCK, M.D., *Associate Editor*
J. DUFFY HANCOCK, M.D., *Associate Editor*
H. EARLE CONWELL, M.D., *Associate Editor*

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THE MEDICAL PROFESSION IN THE SOUTH IN TIME OF WAR

The United States prides itself on the fact that it is a peaceful nation: that it abhors the idea of aggression: that it has no desire for territorial additions. Yet the record shows that since 1775 we have engaged in six major wars with foreign powers and one internecine war. This does not take into account the innumerable wars which we waged with the Indians and their allies, the French, while this non-aggressor nation was establishing a protectorate over the native Indians to save them from the French, the English and the Spaniards and, incidentally, acquiring their land and its natural resources for its use.

Since first recorded time history has been full of war and conquest. Even Sacred Writings have been no exception and have recorded, with a sense of pride and justification, the overthrow of nations; the slaying of peoples and the acquiring of their properties by force. It would seem then that regardless of how peace-loving a nation may be, if it doesn't provide means of protecting itself by force it will in time cease to play a part on the world's stage.

This business of war has a peculiar psychologic setting. It is impossible to explain why nations should be allowed to settle their differences by mass murder and wholesale killings when that method has been denied individuals by practically every civilized nation. However, since such is the case it appears that we will still be shouldering arms and marching out to war long after this generation has passed on, either to its reward or its retribution.

Presidential Address before the thirteenth annual Assembly of The Southeastern Surgical Congress, Atlanta, March 10, 1942.

The medical profession has always played a very unusual part in war. The physician is a non-belligerent and as such is recognized by all countries. His object is to save, not only the lives of his own countrymen, either injured in war or sick from disease, but also to save the lives of his country's enemies. The ethics of his profession would forbid his doing anything else and yet, when we look over the records of the earlier wars the United States has fought, we have found that the physician has always played a prominent part in the planning of campaigns. He has frequently been the former physician and the personal intimate of the generals who were planning the strategies of war.

At the present time the position of the medical profession is even more important than it has ever been before. In former wars illness resulted in more deaths than the direct casualties of battle. Typhoid, smallpox, yellow fever, malaria, plague have taken their toll far in excess of shrapnel and shot and shell. Now, however, the advances of medical science have eliminated many of the diseases that were a grim specter in other wars and a new challenge has come to the medical profession. This is the "all out, total war" which shows no distinction between civilians, women and little children, and the fighting forces. The bomber, with its machine guns, and the submarine make no distinction and show no mercy. I do not know the present figures but at one time the casualties among the civilian population of England far exceeded the injuries to the Empire's forces under arms.

So the profession has to meet the double challenge: First, to prevent sickness from decimating the troops in camps; to see that their morale is kept intact with proper food and proper housing; to see that their strength is maintained while they are being seasoned and prepared for the rigorous life of an active campaign. This is the duty of the physicians who are being inducted into active military service. Another group must meet the second challenge: that of seeing that the civilian population is properly cared for; that necessary vitamins are obtained for growing children; that no epidemics creep in to rob the country of its future citizens and, in case of air raids, to see that the victims of bombs and fires shall receive prompt and adequate care. This must be done in order that the soldier at the front will feel no misgivings that the family he left behind is not receiving the best care that his Government and the medical profession can give them. This is not the least of the task being assigned to the medical profession in our most recent war.

May we spend just a short time on the part that the medical profession has played in former wars? The Colonial Army was a

rather loosely organized affair. Each of the thirteen states threw into the fight individual armies of its own, equipped with its own medical personnel. For instance, in the first year of the War, Virginia inducted 5,000 men into the Colonial Army and sent with them 230 physicians from the State's rather meager supply. It is interesting that a number of the doctors from the South held high commissions in the Colonial Army and apparently played a part in the planning of campaigns as well as in the care of the sick. Hospitals were provided rather haphazardly when the exigencies of battle demanded them and it was common to commandeer larger homes or public buildings to be used as hospitals for the wounded or as pesthouses for the victims of smallpox and other contagious diseases. The injured French soldiers were frequently quartered in private homes throughout Virginia and some of the other Southern States.

The War of 1812, being largely a naval war and lasting only a short time, less than two and one half years, did not make heavy demands upon the medical profession; neither did the Mexican War of 1846 to 48. There are no outstanding medical characters in either of these wars.

The Civil War was an entirely different story. It taxed the entire country, both as to man power and natural resources. Blanton states in "Medicine in Virginia in the 19th Century": "The total forces of the Confederate Army did not exceed 600,000 men. To care for these troops there were fewer than 3,000 medical officers; 834 surgeons and 1,668 assistant surgeons, a ratio less than one half of that provided for a modern army." Probably not more than 300,000 were under arms at any one time but practically the entire 600,000 came under the care of the medical profession, not once, but many times during the four years of the war, and there were 200,000 deaths from wounds and disease. It was estimated that 53,973 men were killed outright during the course of the war. On April 24, 1861, the Convention of Virginia passed an ordinance organizing the military forces of the State, and the medical department with a surgeon general, 10 surgeons and 10 assistant surgeons was provided. Charles Bell Gibson of Richmond was appointed Surgeon General. At this time Dr. Hunter McGuire of Richmond, the Chief Surgeon of Stonewall Jackson's Division, was responsible for an innovation in modern warfare. He placed on parole the medical officers who were captured and, in some instances, returned them to their own commands to care for their sick and wounded. That suggestion was later made by Henry Donet at the International Red Cross in Geneva. From then until the breaking down of all previously conceived ideas of international law in this

present conflict, this conception, that the medical officer is a non-combatant has been accepted.

The Spanish-American War did not last long enough to make any particular drain upon either our civilian population, our medical profession or our financial resources. It was before the days of typhoid inoculation and it is a fact that we lost more men from typhoid and other infectious diseases than we did in actual combat.

The World War of 1917-18, while calling for a much larger number of men in actual combat, still produced very little depletion of our civilian population or natural wealth. This conflict we took in our stride and we almost adopted the British motto of "Business as usual." At the time of the Armistice in 1918 the Army had a little over 3,500,000 men in uniform and 31,500 medical officers. We had lost a much smaller proportion of men from disease than in any previous war. Typhoid, thanks to inoculation, no longer accounted for any large number of either casualties or morbidities. Before we entered the conflict the British and the French had already demonstrated that the immediate inoculation of antitetanus serum practically eliminated tetanus. There was never any possibility of our own shores being invaded, so we had very little disturbance of our civilian morale. The most serious conditions which our medical profession had to face were the measles epidemic of 1917 and the influenza epidemic of 1918.

But this war of December 1941 is an entirely different proposition. It is a total war and our own country is in imminent danger of invasion. Our own homes may be bombed and our own loved ones may be non-combatant casualties. Immediately following the declaration of war it was planned that the Standing Army of the United States would be increased to the war time strength of the Army at the close of World War I, that is 3,500,000 men. Fortunately 1,500,000 of these men had had almost a year in camp, subjected to all the discipline of army training and, while they had seen no actual fighting, they were already seasoned veterans. This is the nucleus which we are now beginning to send into the conflict. These men, of course, are taking their own medical officers with them, many of them being regular army officers. This will produce vacancies in the medical personnel which should be immediately filled through the Procurement and Assignment Service Commission. It will require that practically all physicians who are physically fit for military service should accept commissions in the Army, leaving a residue of younger men to complete their internship and the older men to provide for the care of the civilians.

The Medical Department of the Army included 11,465 phy-

sicians and it was figured that there should be about 6 medical officers for each 1,000 men. When the standing army is raised to 3,500,000 as contemplated it will necessitate, at the present rate, at least 21,000 medical officers. However, 3,500,000 men under arms is not the ultimate goal by any means and if the war lasts until 1943, as military experts seem to think it will, it is estimated that 7,000,000 fighting men will be needed. This will require a personnel of 42,000 medical officers.

The Navy requires 6.5 physicians for every 1,000 of its personnel. At the beginning of this emergency in December it had a pool of 1,000 in reserve. However, they are using up this reserve very rapidly, and in the near future it is possible that some means will have to be found for augmenting their medical corps. Heretofore the Navy has depended entirely upon voluntary enlistment for recruiting its medical personnel, whereas the Army has taken for granted that the physician in the draft age would either apply for a commission as an officer in the medical corps or else allow himself to be drafted into the Regular Army as a private.

Quite early it became apparent that there would not be enough doctors to care for the Army and Navy as well as the civilian population. For a number of years the medical colleges have graduated about 5,000 doctors a year. Practically all of these have gone into hospitals for at least one year's intern service. A fairly large number of them have elected to take two and three year internship, and a smaller number, who were qualifying themselves for various specialty boards have taken four and five year residencies.

The retirement of physicians from general practice each year, either by death or disability, also averages about 5,000. So, with no special call upon the medical profession, the students graduating and the physicians retiring have been fairly well balanced for a number of years. The Federal Government early recognized that with these special demands made upon it the profession would rapidly become depleted. It had already been decided that premedical students, with accredited standing, were to be allowed to complete their premedical training, four years of medical college and at least one year internship before induction into the Army as medical officers. A large number availed themselves of this opportunity to complete their preparation for their life work. At present it is contemplated to graduate medical students in a three year course of intensive training in order to increase the supply of physicians.

It has been contended that a few of our young doctors did not play exactly fair. When the selective draft age was lowered from

36 to 28 some of these young men had passed the age of 28 before they had completed their year's internship and some others had acquired dependents in the shape of a wife and children which took them out of the Class A group. However, my own feeling is that only a very few of them took this short cut to evade military service. Now that the age has been put back to 36 and that all men under 45 must register with the possibility of being inducted into some form of defense activities, this situation should adjust itself in a short time.

A number of perplexing questions are arising. For instance one that has been discussed in my own State is this: A number of industrial areas, particularly in coal mines, have been accustomed to employ young men who have just finished their hospital training. These physicians want three or four years in which to gain some self reliance and in which to recoup their depleted finances before setting out in their quest for more desirable practices. These men are now being called to military service and both the laborers in these industries and their dependents are sometimes left without medical aid. Some provision should be made to adjust this condition. That can almost certainly be arranged through the Procurement Office. For the purpose of trying to obtain sufficient medical men to care for the men in camps and on active military duty and, at the same time, provide adequate care for the civilian population, on the recommendation of Mr. McNutt, the President appointed a Procurement and Assignment Service with Major Sam F. Seeley at its head. This Committee, with Dr. Frank H. Lahey as Chairman, James E. Paullin, M. D., Harvey B. Stone, M. D., Harold S. Deihl, M. D., and C. Willard Camalier, D. D. S., has been functioning since shortly before the first of the year. They have asked all physicians in the United States, regardless of age, to register with them for any service that their physical condition permits. They also have access to the card indexing of the questionnaires mailed out by the A. M. A. in June 1940. The names of 182,925 physicians have been card-indexed and tabulated as to their availability for military or civilian duty. These data are in the office of the A.M.A. May I assure you that the Federal Government has no desire to place on military duty physicians who are physically unfit for that type of service. If you haven't already filled out the procurement blank mailed from Major Seeley's office, will you not do so at once and thus show your desire and intention to stand by your Government in this time of stress?

The present emergency is going to inflict hardship upon our recent graduates from two different angles: First, those young men who had planned to qualify themselves for the various specialty

boards, cannot be allowed to complete the from three to five year internships and residencies which these boards are now requiring. This would mean that they would have to start all over again in their hospital training after the War is over. The other group affected is composed of young doctors who had planned to take one year's internship and then begin general practice. They too will be inducted immediately into the armed services and when they return to civilian life they are going to find that the golden opportunity to get established in private practice is gone.

A large number of European refugees have been seeping into the country. Under the present ruling they are not eligible for military service, so they are settling down in the urban communities, getting themselves firmly established and acquiring the practices that our own young doctors had looked forward to as their just heritage after their arduous years of study and preparation had been completed. Very few of these refugees are seeking practice in rural communities where there is the greatest shortage of medical care.

I have great sympathy for these alien physicians who have been torn up bodily by ideologies in which they had no part and have been transported to distant countries to make a new home for themselves and families, among people whose customs and in many instances whose language even, is unfamiliar to them. But I have even a more marked sympathy for those graduates of our own universities whose plan of life has been so rudely upset by this national emergency and I feel that those of us older men who are left behind in the care of civilian practice should attempt to get these men properly established and on their feet when this time of strife is over. Notice that I say, "When this time of strife is over" for I know that at the present time the only thought of the entire medical profession is to supply the Federal Government with all the men it needs to carry on this War, to assure definite, permanent victory as early as possible. Individual desires and aims and aspirations should be entirely submerged for the one purpose of victory. But I do feel that when that has been accomplished our first purpose should be the return of these younger men to the opportunity to serve which was evidently their purpose when they aspired to the medical profession in the beginning.

A survey of the eleven Southeastern States shows that from 5 to 10 per cent of the physicians in those States were already in some branch of the Federal Service before December 7th. At the present time more than 15 per cent of the doctors in some of these States have asked for commissions. That leaves an average of about 1

physician to 1500 of the civilian population. In some of the more thickly populated urban centers the number may run 1 to 800, but a number of these are highly specialized physicians who are not available at all for general practice. In some of the rural communities the ratio at present is as low as 1 to 2500 civilians.

The grim fact which we must face is: If we lose this war the medical profession has no future that offers any such prospects of either pleasure, study or service comparable to what we now have. So we have no choice. I am sure that all of you feel about this as I do; that we are going home from this meeting fully determined that all of the energies, all the resources of the medical profession in the South, will be unreservedly at the disposal of our Government, to be used when, where and in whatever manner it finds necessary, to the end that our children and our children's children may live free to walk upright; that no one may dictate to them the hours of their service and no man may deny them the right to worship the God of their fathers.

JULIAN L. RAWLS, M. D.

708 Medical Arts Building
Norfolk, Virginia

THE FIRST WAR-TIME ASSEMBLY

There were grounds for considerable apprehension as to the success of the thirteenth Postgraduate Surgical Assembly of The Southeastern Surgical Congress. The Committees in charge of the various arrangements would hardly have been surprised if no one had come from more than fifty miles. To their unbounded delight the registration was one of the largest yet. Credit for this must be largely assigned to Dr. Dan Y. Sage and his Program Committee: these gentlemen went to work almost before the 1941 Assembly was over and, foresightedly, determined then to make the program one suitable for a nation at war,—and how they did succeed!

As a sort of curtain-raiser, Sunday afternoon, the day before the Assembly, a program for the general public was offered in the beautiful new home of the Fulton County Medical Society. Dr. Julian L. Rawls, of Norfolk, President of the Congress, spoke on the duties of civilians in time of war. He sketched conditions in England as regards the health of the population and the importance of learning first aid, emphasizing that even twenty hours of instruction will not make a doctor of a layman. The War is causing a shortage of doctors for civilians. Since a doctor can see several patients in his office in the time it takes to make one house call, he urged his hearers to go to the doctor's office when in need of medical attention if at all possible. He added,

"I wonder if you realize that 75 per cent of calls made on a physician at night are not necessary and could easily wait until morning without injury to the patient? There is nothing that disturbs the morale of your doctor or breaks down his ability to work more than repeated night calls."

Colonel Sanford W. French, Surgeon for the Fourth Corps Area, outlined how it is determined when a man who draws "the lucky number" shall or shall not go into the Army, and what happens to those who do at the Induction Center.

Dr. James Edgar Paullin, of Atlanta, President of the American College of Physicians, who had been in Washington the day before for a meeting of the Procurement and Assignment Agency, succeeded in making the Atlanta airport, in spite of bad weather, in time for his address. He again impressed upon the audience that doctors will be scarce, that the War would soon make it necessary to ration the services of physicians "like sugar and tires." He dwelt on the importance of learning as much as possible about first aid and nursing care. "Within the next six months we are going to see things happen that will need the services of persons trained in first aid and home nursing."

Later that day Dr. Beasley held a reception in honor of Dr. Rawls, and Dr. Davison a buffet supper.

Monday morning, March 9, after the Boys High School band had played the National Anthem and the audience had sung America, the President, Dr. Julian L. Rawls, called the Assembly to order in the ballroom of the Biltmore Hotel, which had been decorated with red, white and blue, with the National Flag at one end of the rostrum and the British at the other. The Rev. William V. Gardner, Pastor of the First Presbyterian Church, pronounced the invocation. The Mayor of Atlanta extended an official welcome. It was Mr. LeCraw's last act of this sort before resigning the mayoralty to enter the Army: his address therefore was in serious vein, and this was quite all right with his hearers. He said that he had confidence that the doctors of the country would so give of their services that "the people who are demanding more and more will say here is one profession that we don't have to make over."

In welcoming the visitors on behalf of the doctors of Atlanta, Dr. T. C. Davison likened young men entering medicine to the pioneers of old, "the timid never started, the weak fell by the roadside, only the virile arrived." He emphasized that "your desire to be better doctors that you may better serve the ailing public" was the reason for the physicians present leaving their work to attend the Assembly, and that the only reason for a hospital is to care for the sick man, woman or child. He announced that the program of the meeting had been arranged for "the man in the service, the man who expects to go in, and for him who *must* stay home."

The scientific program for Monday morning was carried out as announced except that Dr. Frederick A. Coller was unable to be present on account of illness. He has however already submitted the paper he prepared for the occasion. Dr. Alton Ochsner substituted for him, speaking on carcinoma of the lung.

In the afternoon session, Dr. Fred W. Rankin, former President of The Southeastern Surgical Congress and President-Elect of the American Medical Association, spoke on "The Medical Profession and War Duties." First, he said, there are only so many doctors to do the job—not more than 150,000 or 160,000 in America to meet all demands, military, civilian and industrial. Secondly, the military services now require 6.7 doctors to serve every 1,000 men. At present there are between 12,000 and 13,000 physicians serving the armed forces, and before long 23,000 doctors will be required in uniform. The medical profession's first duty is to the armed services. Thirdly, there must be maintained the maximum production of new doctors with no sacrifice of standards of education.

Paul V. McNutt's address was in some respects the high point of the meet ing. It is printed in full at the first of the number.

At the evening session Dr. Rawls delivered the Presidential Address, which also appears elsewhere in this issue. Dr. Hilliard E. Miller, of New Orleans, read the C. Jeff Miller Memorial Lecture, which will be published in an early number. Dr. George Baehr spoke of preparations for the care of civilian casualties.

The scientific program for the second day was carried out as announced though with certain rearrangement.

At the Business Session the Congress chose Dr. Elmer H. Henderson, of Louisville, its President-Elect and Dr. Frederick Waas of Jacksonville its Vice-President. Invitations were received from a number of cities for the 1943 Assembly. Remembering the royal welcome given us in 1938 and that that year the registration was the record so far, The Congress elected to go to Louisville next year,—though obviously, conditions being what they are, all such plans are subject to change.

At the meeting of the Fellows the following deaths were announced:

DR. WILLIS C. CAMPBELL
Memphis
May 4, 1941

DR. F. M. BARFIELD
Atlanta
April 17, 1941

DR. D. C. MCBRIDE
Alexandria, Louisiana
June 12, 1941

Dr. J. K. Johnston
Tallahassee
July 15, 1941

Dr. Kenneth R. Bell
Captain, Medical Corps, U. S. A.
Camp Claiborne, Louisiana
(formerly Sanford, Florida)
Dec. 4, 1941

Dr. R. H. Walker
Charleston, West Virginia
Feb. 19, 1942

The Congress stood in reverent silence to do them homage.

Not one tear was observed that the Banquet was dropped from the pro gram. The play presented by the Atlanta Theatre Guild is described elsewhere.

The program for the closing day was incomplete due to the absence of Dr Earle B. Mahoney, of Rochester, New York.

It is not surprising that this year the men and women who came to the Assembly came with a purpose and they took it all seriously. The convention hall was always well filled and when at the closing session Dr. Rawls handed over the gavel to his successor, Dr. Ochsner, there were nearly 300 present.

Listed below are the exhibitors who cooperated with The Congress in making the Atlanta Assembly such a successful one:

Abbott Laboratories, North Chicago, Ill.
American Cystoscope Makers, Inc., New York
American Hospital Supply Corporation, Chicago
American Safety Razor Corporation, Brooklyn
The Coca-Cola Company, Atlanta
Cutter Laboratories, Atlanta
Davis & Geck, Inc., Brooklyn
DePuy Manufacturing Co., Warsaw, Ind.
The Doho Chemical Corporation, New York
Eli Lilly and Company, Indianapolis
Estes Surgical Supply Co., Atlanta
C. B. Fleet Company, Lynchburg, Va.
The Harrower Laboratory, Inc., Glendale, Cal.
Holland-Rantos Company, Inc., New York
Johnson & Johnson, New Brunswick, N. J.
Kellogg Company, Battle Creek, Mich.
Lederle Laboratories, New York
Mead Johnson & Company, Evansville, Ind.
Medco Products, Indianapolis
The C. V. Mosby Company, St. Louis
Frank B. Neely, Publishers Representative, Atlanta
Radium Chemical Company, Inc., New York
S. & H. X-Ray Company, Atlanta
J. R. Siebrandt Manufacturing Company, Kansas City
E. R. Squibb & Sons, New York
Van Pelt & Brown, Inc., Richmond
Winthrop Chemical Company, Inc., New York
Zimmer Manufacturing Co., Warsaw, Ind.

CRAWFORD LONG DRAMATIZED

As an innovation form of entertainment the Atlanta committee put on a play at the recent meeting of the Congress instead of staging the accustomed banquet. Judging from the reports of those who attended the performance the change in program was welcomed enthusiastically. The success of the venture belongs to the Atlanta Theater Guild, an amateur group which has given many enjoyable shows during the past few years. Based on an authentic account of the life and work of Crawford W. Long, members of the Guild wrote and produced a dramatic, interesting play, in which the playwright's license did not make it necessary to veer one iota from the truth to obtain absorbing effects.

The play was written by Christine Carmichael, Sidney F. Owen and Frank L. Belyeu, D. D. S., Dr. Belyeu being president of the organization. The cast of characters, in order of their appearance on the stage, was as follows:

Dr. Crawford W. Long.....Dr. Frank L. Belyeu
Mandy.....Dorothy Cantrell
P. A. Wilhite.....A. Edward Macon
John Groves.....Bill Smith
Edmund Rawls.....Joe Graham Reeves
James E. Hayes.....William Hirsch
Mr. Miller.....George Graham
Mrs. Miller.....Frances Gridley
Mrs. William Thurmond.....Maureen Beall
Col. William Thurmond.....George T. Bush
Caroline Swain.....Christine Carmichael
Clarabelle.....Emmie Bolton
Polly.....Billie Bennett
Cynthia.....Betty Taylor
Emma.....Charlotte Downing
James Venable.....Ed Matthews, Jr.

Young Dr. Crawford Long has just opened his office in the village of Jefferson, Georgia, and the first act shows him in his living room and office surrounded by the young friends who later are to witness the administration of the first anesthetic, three of the number being medical students. After passing pleasantries, and telling of events to fix the time, plans are announced for a party in the near future when the young physician will allow his guests to inhale some of the ether which is in his possession in lieu of nitrous oxide gas which he cannot obtain. The group has heard of the queer effects of breathing laughing gas, and Dr. Long has told them that judging from information which he learned while "walking the hospitals" in New York City, he believes ether will produce the same results. The act is brought to an exciting close by the entrance of a farmer who has just sustained a dislocated hip. He is brought in by his wife and Long's friends who finally succeed in placing him on the operating table. All the time he is groaning, and crying out loud when any attempt is made to move him. Dr. Long diagnoses a dislocated hip, and asks his friends to hold the patient while he attempts a reduction. In the meantime two or three large drinks of whiskey are poured down the victim's throat. As Long manipulates the hip-joint loud indications of pain emanate from the patient, with language scarcely fit to print. The reduction is suc-

cessful, and the patient is taken home. As the curtain comes down the young doctor soliloquizes, "This is terrible! When shall we find some means of preventing such unnecessary suffering?"

The second act shows the party, with all the boys and girls dressed in their best, the fashions shown being correct ones for the year 1842. Colonel and Mrs. Thurmond are the only matured people in the play, and their sallies, observations and interesting reminiscences are a fine addition. Caroline Swain, Long's sweetheart, whom he marries subsequently, is most charming, as are

Dr. Long, Col. Thurmond, Mrs. Thurmond and Caroline.

(Photograph by Bill Mason, Atlanta Constitution)

the other ladies of the cast, while particular praise must be given the old family servant, Mandy, who plays her difficult part to perfection. All the young men in the play exhibit much talent and spirit. Crawford Long produces his ether, and all the boys take a few sniffs. Immediately they begin to wheel around the room helplessly, striking each other, and falling against the furniture. As the effects of the brief anesthetic period wear off, one fellow exclaims, "Look at my leg. It's bleeding. When did I do that?" Another

one cries out to the doctor, "I believe I have sprained my ankle. It hurts and is beginning to swell." Then a great light dawns upon our hero. "Didn't you know you had barked your shin? Couldn't you feel the pain? Didn't you know you had sprained your ankle?" he asks. As all answer in the negative, he speaks to young James Venable who has consulted him about removing a small tumor from his neck, "James, I believe I can remove this tumor without causing you any pain, if you will inhale enough of this ether to put you sound asleep. Will you do it?" "I think I will," replies Venable; "I'll let you know." Upon which the curtain falls upon the second act of the Story of Anesthesia.

THE CLIMAX OF THE PLAY

From left to right: Narrator (Sydney Owen), Colonel Thurmond (George T. Bush), Dr. Long (Dr. Belyeu), Edmund Rawls (Joe Graham Reeves) and P. A. Wilhite (A. Edward Macon).

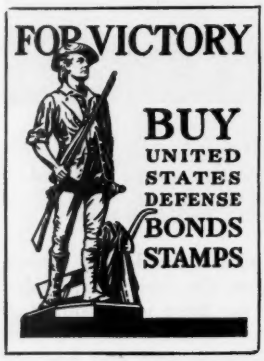
World Wide Photos

Act III. Venable has considered the matter and has decided to become Long's first candidate for anesthesia. He lies upon the table, surrounded by the doctor and four of his friends. Needless to say there is no boiling of instruments nor sterilizing of hands. Even no coat is removed, nor even sleeves rolled up. Crawford Long administers the drug himself, and does not allow the patient to do it as some of his detractors would have us believe. Convinced that Venable is asleep, since he does not respond to pinching, his head is turned to one side, and the growth quickly removed. Doctors of this day probably could operate more rapidly than we can today, because they had to—with no anesthetic, and a screaming, kicking patient to deal with. Naturally Dr. Long's audience is overcome by his remarkable triumph, and shower him

with congratulations. Col. Thurmond, who has witnessed the historic event, delivers an appropriate speech. But Long, with his well-known, almost fatal modesty, says that he feels more humility than elation. He knows that he has accomplished a feat of inestimable importance, something the world has waited for all the centuries. He is overcome by the immensity of the achievement, and for a moment can scarcely speak. Then he seems almost to offer up a prayer of thankfulness to Heaven, and says, "This is only the beginning. There is much yet to be learned about this matter."

Dr. Belyeu as Crawford Long is great. It is difficult to see how the part could have been acted better. He possesses the proper poise and dignity, which belonged to the man he is portraying, and he has the height, both men standing more than six feet. The theater of the Atlanta Woman's Club furnishes a perfect setting for such a performance, and practically every seat was taken. A colorful addition to the audience was a large group of nurses in uniform. Already news of the show has gone abroad, and they are calling for it in many places. Mr. Loranz wants it for the Southern Medical Association in Richmond this year, and the Medical Association of Georgia may show it at the annual meeting in Augusta. The performance will be repeated in Atlanta March 30, as part of the celebration of Doctor's Day put on every year by the Women's Auxiliary of the Fulton County Medical Society. Again thanks are extended to the Atlanta Theater Guild for presenting such a fine performance, without compensation. Such a demonstration is more impressive and worth more than many papers and addresses in telling the world the true story of the discovery of anesthesia.

FRANK K. BOLAND, M. D.



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